



Region 4

Serving IEEE Members in all or parts of Illinois, Indiana, Iowa, Michigan, Minnesota Nebraska, North and South Dakota, Ohio, and Wisconsin



2023 – Issue 04

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Director's Column

Congratulations across the Region

EAB Awards were held during the November Board series in Washington, D.C.

Awardees from the Region included: Chase Anderson (Twin Cities Section) winner of the IEEE Life Members Graduate Study Fellowship in Electrical Engineering.

Science Kits for Public Libraries (SKPL) team John A. Zulaski, Norman E. Phoenix, Douglas DeBoer, Michael J. Wiltermood, Rajeev Verma, Marilyn Genter, and William D. Wilkens for receiving the Meritorious Achievement Award in Outreach and Informal Education.



November Board Meeting

The November IEEE Board meeting series was held in Washington, D.C. November 15-20, 2023. During the series I represented the Region at the MGA Assembly Meeting, the MGA Directors Forum, and the MGA Board meeting, as well as the IEEE USA Board meeting and the IEEE Board of Directors meeting. We selected the slate of candidates for IEEE President Elect for 2025 and approved the 2024 IEEE and MGA Committee appointments.



Reflections 2023

Membership numbers across IEEE have reached an all-time high of over 450,000 members. Region 4 was one of only two US Regions to have positive growth in 2023. Congratulations to the Fort Wayne, Arrowhead, and West Michigan Sections for meeting both their retention and recruitment goals.

Overall the Region recruitment rate was at 106% of our goal, with Central Indiana leading the way achieving 138% of their goal. Retention for the Region was a little short of our goal. We did have 5 Sections achieve their goal: Arrowhead, Cedar Rapids, Fort Wayne, Red River Valley, and West Michigan.

Elevations - this year we elevated 161 members to [Senior Members](#). Thank you to everyone who held elevation events, volunteered to be references, or helped in any way.

Benefit of being a Senior Member

As an IEEE Senior member, you receive the following benefits:

- 1) **Recognition:** The professional recognition of your peers for technical and professional excellence.
- 2) **Leadership Eligibility:** Senior members are eligible to hold executive IEEE volunteer positions.
- 3) **Ability to refer other candidates:** Senior members can serve as a reference for other applicants for Senior Membership.
- 4) **Review panel:** Senior members are invited to be on the panel to review Senior member applications.
- 5) **Letter of commendation:** A letter of commendation on the achievement of Senior member grade will be sent to your employer (upon your request).
- 6) **Announcements:** Announcement of your elevation can be made in section/society and/or local newsletters, newspapers, and notices.

New Chapters

The new Magnetics Society Chapter was formed in Southeastern Michigan. The effective date was June 8, 2023. Congratulations to Steven Louis, Cody Trevillian, Vasyl Tyberkevich and Hannah Bradley on the formation of this chapter. With the addition of this chapter Southeastern Michigan now has 18 chapters, which makes them the largest Section by Chapter count.

The new Electronics Packaging Society (EPS) Chapter was formed in the Central Indiana Section. The effective date of this chapter formation was April 13, 2023. Congratulations to Tiwei Wei the Chair and to the other committee members Parimala Vydyula, Xin Xu, Michael Cracraft, Manohar Bongarala, and Tarek Mohammas.

We also received a petition to form the IEEE Purdue University-West Lafayette IEEE Systems, Man, and Cybernetics Society Student Branch Chapter in the Central Indiana Section. The application was approved by the Region and is waiting for final MGA approvals.

Conferences and Events

The Region and Sections hosted several outstanding conferences and events this past year.

Officer Training

New officer training is being hosted by Southeastern Michigan Section and is open to any "newly" elected section officer, veterans, and volunteers interested in learning more about the committee positions. You can sign up in vTools for the sessions that interest you.

Agenda

Day	Date	General Topic/Theme	Primary Focus	Areas covered	Duration
Sat	1/13/2024	vTools	Communications	Volunteer tools/resources for the Primary Teams	2 Hrs
Sat	1/20/2024	Collabratec	Communications	Primary & Extended Team	2 Hrs
Sat	1/27/2024	Leadership	Chair	Chair Duties / Responsibilities	2 Hrs
Sat	2/3/2024	Leadership	V-Chair	Vice-Chair Duties & Responsibilities	2 Hrs
Sat	2/10/2024	Leadership	Secretary	Secretary Duties & Responsibilities	2 Hrs
Sat	2/17/2024	Leadership	Treasurer	Treasurer Duties & Responsibilities	2 Hrs
Sat	2/24/2024	Leadership	Extended Team	IEEE code of Ethics (updated)	2 Hrs

Region Committee:

Your Region Committee for 2023 is here to provide support. Have questions, need help with events, or just want to bounce an idea off someone please reach out. The roster can be found on our region website [here](#). Check out all the upcoming Region 4 events [here](#).

As always, thank you for all you do for IEEE!
Respectfully submitted,
Vickie Ozburn
Region 4 Director

**Editorial Corner*****In this issue:***

This edition has been our **biggest** one in terms of contributions. Our many thanks to all those who contributed.

To start off with – there is the Call for Papers from the International EIT Conference, which will be held in Eau Claire, Wisconsin in 2024.

The R4 supported Science Kit for Public Libraries (SKPL) is continuing its admirable work and is growing ever wider.

The WIE leadership Summit was a great success, read all about it on page 9.

We had several of our R4 members share technical articles on various topics ranging from Lithium-Ion batteries, AI in Health Care, DoE Award to protect our grid, papers published on advanced networking & communications, particle physics, AI symposiums, Geospatial Analysis to stock market price prediction! It is indeed a delight to know we have such a vast diversity of talent in our community. Not to forget – we have Humanitarian Activities also ongoing. Finally, a quick round up/updates of local member activities from some of our larger sections and a note about IEEE Day helps complete this issue.

Previous editions in this series may be found on the [Region 4 website](#). Click on the “Newsletter” button in the top left column. Comments and suggestions may be sent to the editor: sharan.kalwani@ieee.org

Word format is preferred. Where possible use the Arial font in point size of 10. Images can be in either JPEG, GIF, PNG or similar formats.

We try to complete the newsletter layout a week before publication, to allow time for review and corrections. If you have an article or notice, please submit it as early as possible. We publish once every quarter.

The newsletter relies on the contributions of our members and officers, so please do not be shy. If you have something that should be shared with the rest of the region, we want to give you that opportunity. The next deadline will be March 20th, 2024.

Sharan Kalwani,
Chair, IEEE Southeastern Michigan Section (2021-2023)
Editor, Region 4 Newsletter and Enthusiastic IEEE volunteer



EIT 2024 CFP



ANNOUNCEMENT and CALL FOR PAPERS (version June, 2023)

2024 IEEE INTERNATIONAL CONFERENCE
on ELECTRO/INFORMATION TECHNOLOGY

May 30, 31, June 1, 2024

University of Wisconsin-Eau Claire, Eau Claire, Wisconsin 54702-4004

<http://www.eit-conference.org/eit2024>

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The IEEE 2024 International Electro/Information Technology Conference, sponsored by the IEEE Region 4 (R4), in collaboration with University of Wisconsin-Eau Claire, is focused on basic/applied research results in the fields of electrical and computer engineering as they relate to Electrical and Computer Engineering, Information Technology, and related applications. The purpose of the conference is to provide a forum for **researchers and industrial investigators** to exchange ideas and discuss developments in these growing fields. There will also be exhibits where the latest electro/information technology tools and products will be showcased. This is also an opportunity for professional activities development, workshops and tutorials.

Topics of interest include but are not limited to:

- **Robotics and Mechatronics**
- **Intelligent Systems and Multi-agent Systems**
- **Control Systems and System Identification**
- **Reconfigurable and Embedded Systems**
- **Power Systems and Power Electronics**
- **Solid State, Consumer and Automotive Electronics**
- **Electronic Design Automation**
- **Biomedical Applications, Telemedicine**
- **Biometrics and Bioinformatics**
- **Nanotechnology**
- **Micro Electromechanical Systems**
- **Electric Vehicles**
- **Wireless communications and Networking**
- **Ad Hoc and Sensor Networks**
- **Internet of Things**
- **Artificial Intelligence and Machine Learning**
- **Cybersecurity**
- **Computer Vision**
- **Signal/Image and Video Processing**
- **Distributed Data Fusion and Mining**
- **Cloud, Mobile, and Distributed Computing**
- **Software Engineering and Middleware Architecture**
- **Engineering Education**

Important dates:

- Submission of full papers: February 16, 2024
- Notification of acceptance: March 15, 2024
- Final manuscript (PDF) due: April 26, 2024
- Early registration: May 10, 2024

For more information, ideas for organizing/chairing sessions, industry participation, tutorials, professional activities sessions, please contact: **Drs. Gomes or Mousavinezhad.**

SKPL in Tomahawk, WI**Tomahawk, WI, Library Ramps Up Collection (And Kids' Curiosity)**

Many IEEE-Region 4 members are familiar with the Science Kits for Public Libraries (SKPL) program. This unique outreach effort provides public libraries in small towns, suburbs, and large cities across the upper Midwest with science kits aimed at grade-school and middle-school kids (and, of course, their parents). The kits provide scientifically accurate games, puzzles, and projects designed to awaken and encourage interest in science and technology. Kits can be used at the library and also checked out and brought home like traditional library books.

Tomahawk is a small city of about 3,800 located in a scenic part of northern Wisconsin, about 150 miles northwest of Green Bay. The Tomahawk Public Library is a well-established and much-used resource in the region.

Spreading the Good News

Outreach Librarian Shana Sewalt describes the launch of the SKPL program at the Tomahawk Public Library: "It began with a carefully planned communications blitz."

The library started by making announcements at ongoing youth programs and publicizing the SKPL kits with an extensive poster display. It also spread the good news in its newsletter, on the homepage of the library website, and even on a local radio station.

Discovering Science Kits Just Right for Kids

At first, some science kits proved difficult to obtain or unwieldy for kids. After diligent exploration, though, the library discovered kits that were just right for their patrons.

Sewalt notes "the two kits we have introduced have been well received." The Sphero BOLT Kit and Lego Education SPIKE™ Prime Kit are popular among youth attending after-school library programs, who say, "the kits are fun and engaging."

These kits offer a wide array of materials, including motors, bricks, sensors, and a central hub. They can be combined to explore a broad spectrum of projects, allowing the library to adapt the complexity to the level of the child using the kit.



Empowering Kids Through Long-Lasting Benefits



According to Sewalt, one young patron checked out the Lego Education SPIKE™ Prime Kit to “prepare for an upcoming 4-H robotics competition. He was glad to have access to the kit...and reported after competing that he had tied for first place!”

“We are thrilled to be able to offer positive STEAM experiences like these,” says Sewalt. The Tomahawk Public Library highly values the ability to “provide youth with the opportunity to spend extended time pursuing self-selected creative coding and robotics projects independently and in collaboration with peers.”

She points out that the flexibility of working with the kits at home and or in conjunction with library programs enables students to “gain new creative outlets they can use to express themselves, develop a better understanding of the digital technologies they use daily, and prepare for attractive, stable employment opportunities.” Summing up, Sewalt states “the benefits are many and long lasting.”

★ To enable more libraries to loan science kits to kids. [Donate](#)

★ We would love to have you join our team [Contact us](#)

Written by Bill Kennedy, Evanston Illinois, SKPL Volunteer.

SKPL Grants Application



Region 4 – Science Kits for Public Libraries program

Deadline for 2024 SKPL Grants is January 15, 2024

The IEEE- Region 4 Science Kits for Public Libraries (SKPL) Grant program is offering up to \$2,000 in funding to public libraries located within Region 4 to enable them to build a circulating collection of science kits.



Do your part

Contact your local library to make them aware of this Grant opportunity. Applications are now being accepted from public libraries located within IEEE- Region 4 until **January 15, 2024**. Details can be found on the Science Kits for Public Libraries website at <https://r4.ieee.org/skpl/>

Public Libraries have a long tradition of building stronger communities by providing life-long learning for children and teens. Please take the opportunity to enrich the resources that your public library has to offer.

We believe all children – regardless of race, gender, financial condition, or home environment – should have access to high-quality, hands-on STEM learning experiences. By making catalyst grants available to public libraries, we empower them to start their own science kit collections that are free and accessible to the public. Kids are able to check out a science kit just like a book.

Xmas Gift Suggestions

In keeping with the season, the Science Kits for Public Libraries (SKPL) Committee has been busy putting together a list and checking it twice of holiday gift ideas that will inspire the budding Engineers in your family.

Here are some links to science kit suppliers and their products that our SKPL grant librarians tell us are popular with their young patrons.

For children ages 3 to 8

Elenco's [Snap Circuits](#)

[Lakeshore Learning](#)

[Thames & Kosmos](#)

[Botley the Coding Robot](#)

[Toysmith's STEM collection](#)

[Learning Resources STEM collection](#)

For ages 6 to 11.

[Sparkfun Inventor's Kit](#)

[Horizon Educational](#)

[MakeBlock](#)

[Lego Boost Robotics](#)

You can enable more public libraries to loan science kits to kids.

[Donate](#)

About R4 Social Media

IEEE Region 4 **Social Media**

Is your OU planning a future event?

Reach us to promote you event on IEEE Region 4 Social Media channels. Send us your event details (vTools Link) and we'll make the design and promote them. Email at chanaka@ieee.org

Follow us on Social Media



WIE Summit Report

 **IEEE WIE INTERNATIONAL
LEADERSHIP SUMMIT**

[Region 4 Women in Engineering Leadership Summit](#) (R4 WIELS) took place on Nov 3rd, 2023, in downtown Detroit at the Microsoft Technology Center. The event was attended by over 90 people including engineers, managers and local students. Main topics are professional development, energy and sustainability, AI and leadership. Volunteers from [IEEE USA](#), [IEEE Humanitarian Technology Board](#) (HTB), [Region 4](#) and [WIE](#) worked together with our local [Southeastern Michigan Section](#) to make it a fun and memorable day for all.

IEEE USA President [Ed Palacio](#) kicked off the event and welcomed everyone. He stressed the value of engaging industry leaders for IEEE to do more. Steve Annear, the first keynote speaker, took the audience's breath away by sharing his captivating life story, growing up in Australia and lost one of his leg before he was 10, and how he overcome life's setback to achieve personal growth and professional success as a CEO for over 25 years, all driven by his ability to set personal standards and value-based approach, instead of letting society define that for him. Annear stressed the importance of developing a clear sense of purpose during one's career and how that not only steers his career direction but also personal life. It is refreshing for the audience to learn to re-orient oneself. Every organization today defines a North Star, the purpose for the company, the North Star drives company strategy, roadmap, and daily operations. It is essential for individuals to have personal North Star. Steve nailed this topic.



Picture 1: Steve Annear

Along the professional development theme, Microsoft's [Muge Wood](#) shared her story on how to survive the big tech layoffs. 2023 has been a historic year of layoffs that have cost tens of thousands of tech workers their jobs. It is likely that many IEEE members may have been impacted. Her practical coping strategies is a great recipe where folks can follow by embracing the power of 'refirement' to make the next play the best play. She defines "refirement" as the act of living a life with even greater purpose and joy on one's own terms. Re-inventing one's purpose, investing in one's identity outside of work and leveraging the period of job change as a catalyst for growth. IEEE can be such a community outside one's work for one to find the refirement.

Ford's [Carlene Bills](#) spoke about the difficulty getting to the top floor in her career. She didn't have the opportunity to get to the top floor by riding the elevator, instead, she climbed the stairs to arrive at the top. This metaphor is extremely motivational, all paths lead to Rome as long as one is willing to try even if it is not an easy path. In her giving back phase of her life, she goes out of her way to encourage others who might have self-doubts, she wants to be the one who holds the elevator door open for others to ride on. Bills is a fun lady, as she spoke, she began dancing in the room. Audience laughed. We can sense her energy in the room, given that lady Bills just returned from a long trip out of town at another event. [Amy Courter](#) elaborated on ways to [Move-Up-In-Your-Ability-To-Be-Your-Very-Best](#).

Professional development track included a talk where IEEE member [Gina Aquilano](#), Senior Director at Analog Devices Inc. presented on technology advancement in electrification. Gina started as an electrical engineer; she worked her way up as a director today. She spoke about how she blends her technical skills with leadership to reach her career today. Gina is in the process of becoming a senior IEEE member. She is well on her path to become an IEEE Fellow in the future.

On the energy and environment track, we have [Adrienne Pierce](#), a start-up CEO from New Sun Road, walked us through her firm's award winning Microgrid Controller innovation. She presented the technical merit of the cloud-based controller and how it is a solution for climate change. She shared case studies of current systems in the Sierra foothills, Puerto Rico, downtown San Jose, CA and Guatemala. In Guatemala, the system is empowering women entrepreneurs to enrich their lives and work. [Kim Getgen](#), Founder and CEO of InnovationForce, spoke about their innovation framework to help power and utilities companies manage and measure outcome from innovation holistically and centrally via a common

innovation framework inspired by *Dr. Linda Hill from Harvard*. Her framework is built on having an innovative culture since Innovation is a human-team sport. Creating cultures that support innovation is as necessary as having the technical answers.



Picture 2: HTB

[Simay Akar](#) (photo on the left) represented IEEE HTB to present electric vehicles and renewable energy system development as part of the HTB initiatives.

ChatGPT overtook the world in less than a year, Microsoft's chief engineer [Jennifer Marsman](#) demystified the various AI models, how they work and their limitations. CEO [Hala Ballouz](#) from Electric Power Engineers LLC highlighted the various AI use cases for power utility sector, especially how AI might optimize power system distribution bringing more renewables online at the right time and right location. [Dr. Shi-Guang Li](#) shared his start-up's achievement developing AI models used to predict and prevent underground water contamination from agriculture run-offs and industrial discharges.

The Summit wrapped up with a panel of a very diverse set of women leaders, a classical music station radio host, a director from Westinghouse Nuclear Energy, a student from University of Michigan, a chemist from LTU, and a mother of four. (See photo on the right.) Liang Downey, the WIELS Summit Chair, facilitated the panel discussion. [Dr. Sibrina Collins](#)'s powerful tool is to engage students through story telling. It is such an effective way to get your points through and bring everyone on board across multi culture and multi-discipline environment. This is a super tool for engineers to practice, try and leverage. Each panelist walked their unique path, but they have arrived at a common point today to embrace their success as overcomers, motivators and contributors.



Picture 3: R4 WIELS Panel

Alexandra Enders is a college student in computer engineering at the University of Michigan. She joined her mother to attend an IEEE Region 4 WIE AI Summit in Chicago in 2019 when she just started high school. Her mother - Kim Enders is a well-loved sponsor of the summit. She attended many AI sessions during the summit, and it was that early exposure to AI motivated her to pursue computer engineering degree today. At the Summit in Detroit, she got connected with [Hala Ballouz](#) and there is an opportunity for her to intern at [Hala Ballouz](#)'s firm in Austin.

Some attendees drove several hours from different parts of [Region 4](#) to attend the summit in Detroit. They shared that the drive is more than worth the travel time and they thanked IEEE for putting together such a high caliber summit. During [Ed Palacio's](#) closing remarks, he said as the IEEE USA President 2023, he had attended many conferences and this one is one of his best. This Summit would not have been successful without the support from [IEEE USA](#), [Region 4](#), [WIE](#), [HTB](#) and [Southeastern Michigan Section](#). IEEE can engage members and non-members by engaging volunteers and leverage industry connections to increase our eminence in our community, connect students with mentors.

Additional photos below



Picture 4: Summit Attendees



Picture 5: IEEE Volunteers (from L to R): Ed Palacio, Kanika Saini, Bige Unluturk, Nevzat Bircan Bugdayci, Gozde Tutuncuoglu, Sharan Kalwani, Ashfiqua Connie, Alycen Wiacek, Vickie Ozburn, Jonathon Choe

Article contributed by Liang Downey, IEEE R4 WIELS Chair
Editing by Sharan Kalwani

Sustainable Lithium-Ion

Addressing Environmental Challenges in Graphite-Anode Lithium-Ion Batteries for Sustainable Energy Solutions

Rijo Jacob Robin, Group Product Manager, Superior Graphite, Chicago, IL

Graphite discreetly underpins our pursuit of sustainable energy solutions, operating subtly amid the spotlight on high-profile innovations. This unassuming element, distinguished by its superior electrical conductivity and thermal stability, assumes a pivotal role in engineering efficient and dependable energy storage solutions. Foundational to the operational integrity of all commercial batteries, particularly within state-of-the-art lithium-ion batteries (LIBs), graphite commands an impressive 95% market share as the favored anode material. Despite its remarkable attributes, graphite often assumes a secondary position in technical discussions, eclipsed by the fervor surrounding materials like lithium, cobalt, and advanced polymers. In the dynamic realm of battery research, the unwavering performance of graphite, though occasionally construed as routine, serves as the cornerstone guaranteeing the uninterrupted functionality of the batteries essential to our daily lives.

As we navigate the landscape of sustainable energy, a critical examination of the environmental impact of essential components, particularly lithium-ion battery (LIB) anodes, becomes imperative. Life Cycle Assessment (LCA) stands out as a vital tool for evaluating the ecological footprint of graphite-based anodes. In this discussion, we explore the challenges inherent in assessing environmental impact and propose collaborative strategies to navigate these complexities.

Overcoming the Data Dilemma: Quality and Availability

A cornerstone of effective LCA is accurate data, a challenge within the graphite supply chain. Procuring comprehensive, high-quality data across each lifecycle phase proves elusive due to the intricate processes, global supply chains, and proprietary manufacturing methodologies of graphite. Direct access to primary data from manufacturers is hindered by confidentiality concerns, posing obstacles to transparent and accurate assessments.

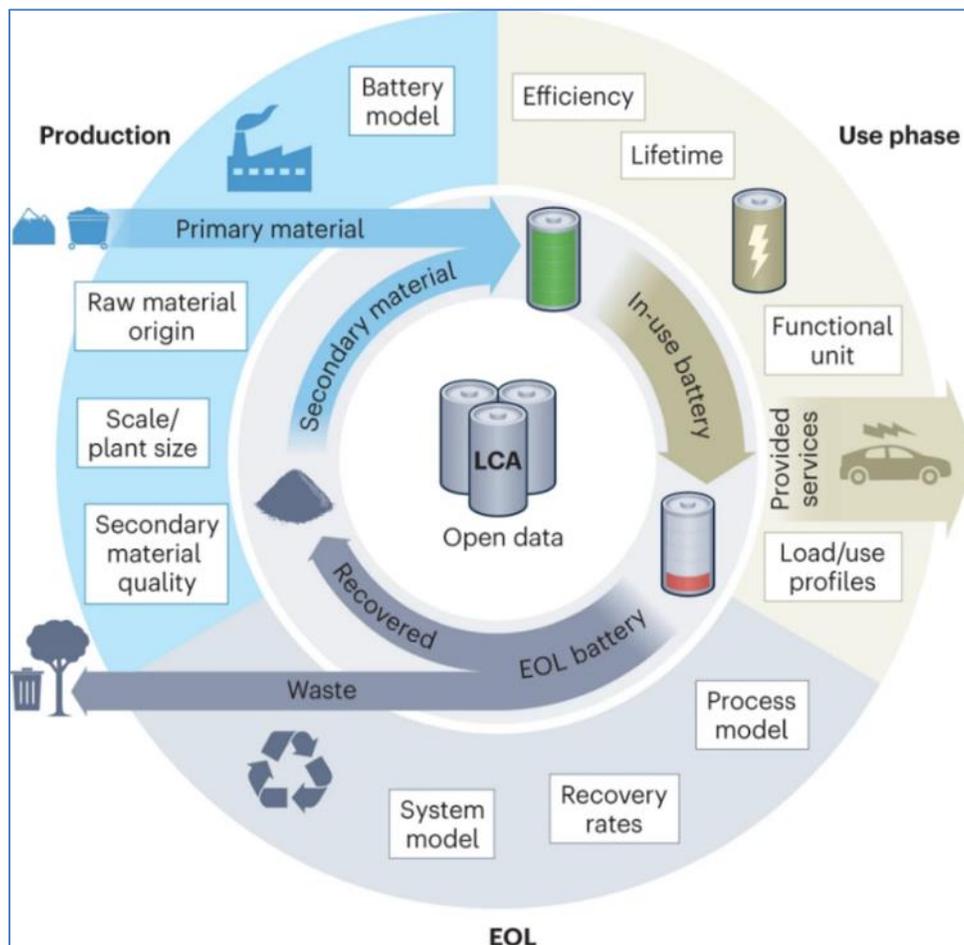
Navigating the Complexity of Carbon Footprints

The carbon footprint of graphite anodes is dynamic, influenced by factors like the type of graphite (natural or synthetic), mining techniques, energy sources, and transportation methods. Inconsistencies and gaps in data collection further complicate carbon footprint calculations. A nuanced understanding of these variables is crucial for precise assessments, making it imperative to bridge these gaps for accurate environmental evaluations.

Striving for Standardization

Effective LCA relies on standardized methodologies and data collection practices. The absence of universally accepted Product Category Rules (PCR) tailored for graphite anodes has resulted in disparate assessment methodologies. While a dedicated PCR for graphite products offers promise, ensuring widespread adherence and the availability of up-to-date primary data remains challenging.

Figure: Schematic representation of the assessment procedure for batteries (Peters, Jens F. 2023)



Beyond Anodes: The Comprehensive Lifecycle Consideration

A critical challenge lies in focusing solely on graphite anodes, providing an incomplete view of battery sustainability. A comprehensive evaluation must encompass the entire battery lifecycle—from production and usage to disposal. Each phase contributes uniquely to the overall picture, and overlooking any aspect may lead to skewed results.

Unmasking Mining's Impact

Mining, integral to graphite production, presents environmental challenges often underrepresented due to data limitations. Natural graphite mining, in particular, can contribute to deforestation, habitat degradation, and water contamination. Acknowledging and addressing these impacts is crucial for a complete understanding of the industry's environmental footprint.

Collaborative Strategies for Overcoming Challenges

Addressing these challenges requires a collaborative effort among researchers, manufacturers, and regulators. Standardizing data collection, sharing best practices, and adopting consistent methodologies are crucial steps. As technology advances and sustainability becomes an increasingly pressing concern, bridging these gaps will be instrumental in shaping a cleaner and greener energy landscape.



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AI Surge in Healthcare

Navigating the AI Surge: Crafting Enterprise-Wide Strategies for Healthcare Organizations

Durga P. Chavali, Author, IT manager, Data and AI scientist and researcher

In the ever-evolving landscape of artificial intelligence (AI) in healthcare, the imperative to establish robust enterprise-wide AI strategies has become more pronounced. The increased investments in AI tools and capabilities have propelled healthcare leaders into a pivotal role, demanding a comprehensive and strategic approach for the successful integration of AI across their organizations.

Smart Utilization of AI: Unleashing the Potential

As highlighted in "Smart use of artificial intelligence in health care," AI-enabled solutions hold immense potential for healthcare organizations. Immediate returns, such as cost reduction and improved consumer engagement, have been witnessed, but the journey is far from complete. Translating strategies into action on a functional level involves communicating a clear AI vision, aiding the workforce in operationalizing AI, and establishing strategic partnerships to meet technical requirements.

Deloitte's Insights: The Evolving Landscape of AI in Healthcare

Deloitte's State of AI in the Enterprise survey, encompassing 2,875 global technology executives, underscores that while AI is rapidly changing, it has not fully evolved. In the context of healthcare, the Deloitte Center for Health Solutions delved deeper, analyzing responses from 220 global healthcare executives and conducting interviews with health system and health plan technology leaders.

The Strategic Importance of AI in Healthcare: A Post-COVID Perspective

The COVID-19 pandemic has served as a catalyst, emphasizing the strategic significance of AI in healthcare. Health organizations, propelled by the urgency of the pandemic, transitioned from fragmented, single-solution initiatives to adopting AI enterprise-wide. The applications of AI in battling the pandemic ranged from patient screenings and symptom monitoring to diagnosis, triaging patients, treatment development, automating hospital functions, and enhancing public health.

Rising Investments and Opportunities: A Shifting Landscape

As the applications and uses of AI in care delivery become more prevalent, healthcare organizations are increasingly recognizing opportunities to harness its potential. A notable 85% of survey respondents expressed their anticipation of increased AI investments in the upcoming fiscal year (2022–23), marking a significant rise from the 73% reported in the previous study.

Charting the Course Ahead: Key Considerations for Healthcare Leaders

1. Clear Communication of AI Vision:

- Articulate a clear and compelling vision for AI integration throughout the organization.
- Foster understanding and enthusiasm among stakeholders about the transformative impact of AI in healthcare.

2. Operationalizing AI in the Workforce:

- Provide comprehensive training programs to empower healthcare professionals in effectively utilizing AI tools.
- Cultivate a culture of continuous learning and adaptation to facilitate seamless integration of AI into daily workflows.

3. Strategic Ecosystem Partnerships:

- Identify and collaborate with the right ecosystem partners to address specific technical needs.
- Leverage external expertise and resources to enhance the organization's AI capabilities.

Innovative Approaches to Data Governance: A Closer Look

One interviewee from a health plan highlighted their commitment to solidifying data governance through a central repository, establishing a singular version of truth. They're also reinforcing data management practices and investing in "explainable AI" to address unconscious bias. For instance, instead of sharing social security numbers for member matching, they now tokenize or deidentify data shared with external entities. Another exemplar is an academic medical center in the United States, proactively addressing AI bias by continually evaluating data purposes and reasons behind AI use throughout its lifetime. This approach ensures the identification and correction of data biases.

Barriers to AI Maturity: Addressing Challenges Head-On

Despite the growing recognition of AI's potential, healthcare organizations face notable barriers in achieving AI maturity. Our interviewees emphasized the pivotal role of integrated, accessible data in AI success, stating that "there is a rich trove of data" when "multiple datasets can talk to each other." However, challenges arise from siloed, unstructured, incomplete, and inaccurate data, compounded by the sensitive and regulated nature of patient-level data. Lack of access to clean, integrated datasets impedes the training of high-performance AI models and their deployment at scale.

Data Inclusivity for Robust AI Models: A Necessary Paradigm Shift

Recognizing the importance of inclusive data practices, healthcare stakeholders are integrating data around drivers of health. Initiatives like the Equitable Data Working Group, formed by the Biden administration, aim to establish equitable data practices, generating disaggregated statistical estimates to depict the experiences of historically underserved groups. Utilizing equitable data in AI models can pinpoint opportunities to improve outcomes for underserved communities.

The Challenge of Enterprise-wide AI Strategy: A Critical Hurdle

Our survey findings reveal that only one in three executives strongly agrees that their organization has an enterprise-wide AI strategy. Leaders face challenges in effectively communicating the vision, differentiating their organizations competitively, and ensuring AI is featured prominently in enterprise-wide strategies. AI, at times, loses out to other organizational priorities, resulting in a fragmented landscape with a lack of unified organization-wide strategy on AI.

Keys to Achieving AI Maturity: Insights from Industry Leaders

Our interviewees and survey respondents highlighted three principles that healthcare leaders should embrace to achieve enterprise-wide AI-led transformation:

1. Gaining Senior Leadership Support:

- An executive champion is essential for crafting and translating the AI vision into achievable action steps and milestones.
- Cultural characteristics set by executive leadership, such as the ability to make tough decisions and manage change, are crucial for AI maturity.

2. Elevating Talent Beyond Technical Skills:

- A mix of technical (AI expertise, data science, project management) and professional (critical thinking, adaptability) skills is essential for AI success.
 - Organizations are making significant changes in workflows and workforce to scale AI initiatives, emphasizing change management and AI readiness.
- 3. Pursuing the Right Ecosystem Partnerships:**
- Collaborate effectively and make strategic decisions on build versus buy for an enterprise-wide AI strategy.
 - Cloud vendors, IT professionals, and consulting firms are identified as key ecosystem partners for AI success.

The Path to an AI-Fueled Future for Healthcare Organizations

Comparing the survey findings shows that healthcare organizations have made progress on their AI initiatives since 2019. The pandemic, in part, has provided avenues for healthcare organizations to quickly turn AI pilots into full-scale implementation in many functions, according to our interviewees. Here's how the path to an enterprise-wide AI transformation moves through the healthcare value chain:

- 1. Operations:**
 - AI-enabled digital authorization for fast and frictionless decision-making.
- 2. Consumer:**
 - AI-enabled personalized services that help in omnichannel engagement for consumer needs.
- 3. Clinical:**
 - AI-enabled care that focuses on prevention, monitoring, and delivery of care.
- 4. Performance:**
 - Autonomous monitoring that helps in real-time anomaly and trend identification.
- 5. Workforce:**
 - AI-enabled smart workforce management by optimizing resource and talent allocations.

When healthcare organizations apply AI across the value chain, they can improve consumer health and well-being and support better outcomes while also boosting organizational efficiency and reducing costs.

The synergy between investments, strategic vision, risk management, innovative data governance practices, and a focus on key principles is crucial as healthcare organizations embark on this transformative AI journey.



Durga P. Chavali

Member News

Dr Prakash Ranganathan, IEEE R4 member, shared this with us all. You can also view the original article at <https://blogs.und.edu/und-today/2023/11/und-receives-u-s-department-of-energy-funding-for-cybersecurity-initiative/>

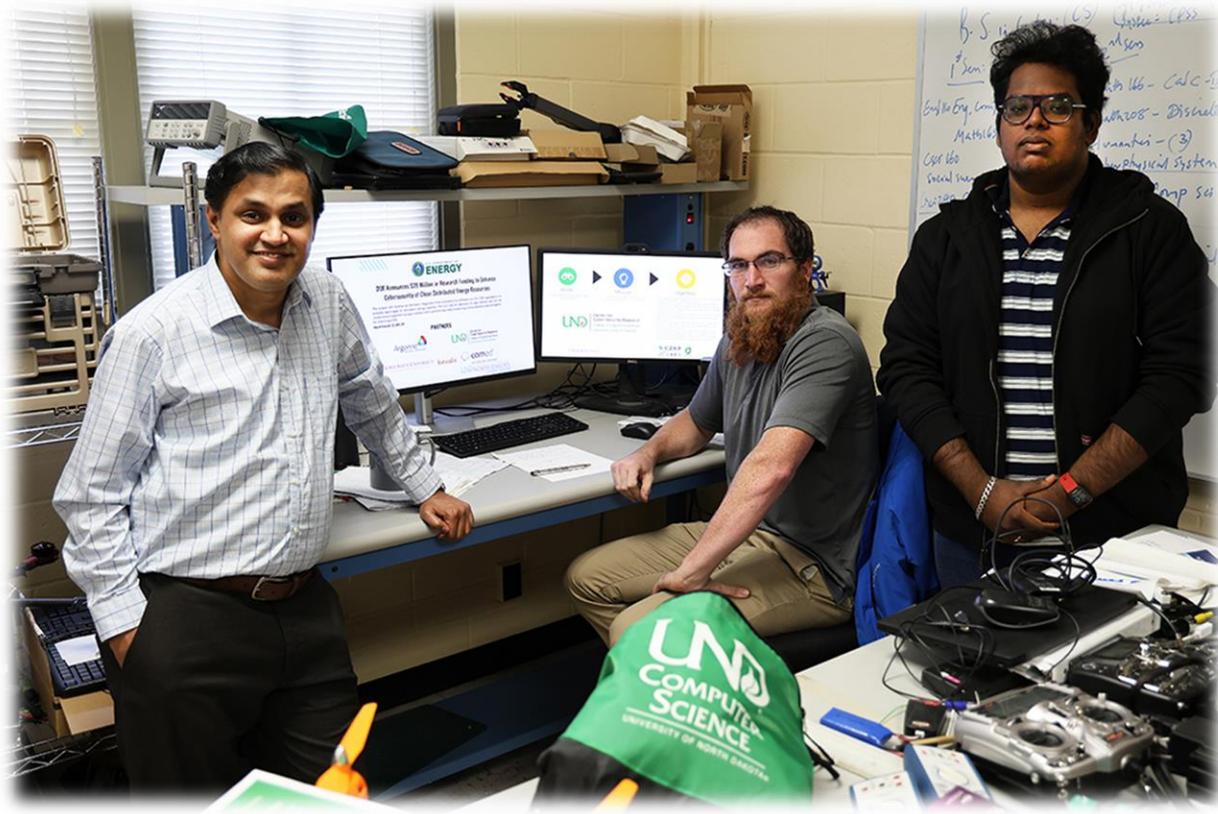


UND receives federal funding for cybersecurity initiative

November 7, 2023, by [Adam Kurtz](#)

Published in: [College of Engineering & Mines](#), [Department of Cyber Security](#), [Discovery](#)

Researchers will work collaboratively with teams from other institutions to develop software tool to protect nation's power grid.



Prakash Ranganathan, associate professor of Electrical Engineering and director of the Center for Cyber Security Research at the UND College of Engineering & Mines (left), Jamison Jangula, a cybersecurity analyst at the College of Engineering & Mines, and graduate student Shree Ram Abayankar Balaji stand in the lab where they conduct cybersecurity research. Photo by Adam Kurtz/UND Today.

UND is among a group of universities, utility companies and national laboratories that have received federal funding to enhance the security of the nation's electrical power grid.

The award comes from the U.S. Department of Energy and will be used by UND researchers to develop algorithms for a cybersecurity software tool to help distributed energy resources, aka DERS, securely participate in wholesale energy markets. DERs include solar and wind power generation methods, as well as other devices such as electric vehicle chargers. These devices, which are usually connected to the internet, require additional cybersecurity measures as they are increasingly added to power grids across the country.

In total, the DOE has awarded \$39 million for nine projects that advance the cybersecurity of DERs. Each project is attached to a National Laboratory, which will work with a specific group of research universities, utility providers and other industry partners.

The cybersecurity project in which UND is participating is attached to the Illinois-based Argonne National Laboratory. In addition to UND, the other research participants are Iowa State University, Kevala (a data analytics company working with electrical grid operators) and ComED (a utility provider serving more than 4 million customers in northern Illinois). The research group has been awarded nearly \$3.5 million for the project, with UND's portion of the grant being \$517,000.

"This is a very timely grant," Prakash Ranganathan, associate professor of Electrical Engineering, and director of the Center for Cyber Security Research at the UND College of Engineering & Mines. "The DOE really wants to address this growing network of distributed energy resources, which means we need to develop realistic attack threats and evaluate the software-based solutions. This requires significant inputs from stakeholders including national labs, electric utilities and research universities."

Brian Tande, dean of the UND College of Engineering & Mines, said the grant advances UND efforts to expand its cybersecurity efforts.

"This new project is well-aligned with the College of Engineering & Mines efforts to grow our capabilities in cybersecurity research," he said. "Dr. Ranganathan has done an excellent job of leading that initiative for the college. We're proud that the DOE has recognized the expertise of Dr. Ranganathan and the larger team and will support this important project to help ensure the security of our energy systems."

Ranganathan said the idea is to develop a software tool that can address cyberattacks on DERs, which can be deployed across electrical grids. As the nation moves toward a zero-emissions policy for electrical utilities, more and more DERs (wind power turbines and solar operations as well as EV charging stations for both at-home and public usage) are being added to power grids, this also increases the need for DERs to operate securely across electrical grids.

This DOE grant is one of the most recent efforts at UND to enhance its cybersecurity undertakings. In mid-October, Ranganathan and Jamison Jangula, a cybersecurity analyst at the College of Engineering & Mines, were invited by the DOE to serve on a panel at the 12th annual GridSecCon event in Quebec City, Canada. The conference is a forum for researchers to share information on securing the North American bulk power system. This year's conference was co-hosted by the North American Electric Reliability Corporation, the Electricity Information Sharing and Analysis Center and the Northeast Power Coordinating Council.

Such collaborative efforts also have continued on the UND campus, with the third annual Cyber Awareness and Research Symposium held on Oct. 30 in the Memorial Union. The symposium, founded by Ranganathan, brought together about 200 participants from nine different countries with the goal of sharing the latest cybersecurity research, and it also offered a networking platform for industry professionals. The symposium also offered the opportunity to highlight student research through research posters on cybersecurity efforts.

More from this Author



[Adam Kurtz](#) is a 2000 graduate of the University of North Dakota. In 2002 he moved to Japan to teach English. There he met his wife and started a family and returned to North Dakota with them in 2019. He worked as a reporter at the Grand Forks Herald before joining the Division of Marketing & Communications at UND in mid-2022 as the Strategic Communications Writer.

More Member News

Udhaya is a Senior Member of the IEEE, and he is delighted to share this with all of us. He is the first author for all 3 papers.

**Papers:**

1. [PRAVEGA](#): Scaling Private 5G RAN via eBPF/XDP, eBPF and Kernel Extensions, ACM SIGCOMM 2023, USA, September 2023

Abstract:

We exploit eBPF+XDP to scale and accelerate software packet processing in (O-RAN compliant) disaggregated 5G RAN (Radio Access Network). We argue that the Central Unit User Plane (CU-UP) component is likely the bottleneck in the 5G RAN user plane data path and therefore focuses on optimizing its performance. We propose an eBPF/XDP-based framework, PRAVEGA, and discuss additional options for further improvements.

2. [Kaala 2.0](#): Scalable IoT/NextG System Simulator, IEEE Network, Volume: 37, Issue: 3, May/June 2023

Abstract:

The IoT world is evolving with the latest technology trends, like edge computing, augmented & virtual reality, machine learning, robotics, and 5G. With the digital transformation happening in Industry 4.0, many industries are moving toward private 5G networks. There are massive number (hundreds to thousands) of IoT devices in a single factory depending on the scale of the industry and these factories consists of critical IoT devices, like fire or gas sensors which need to operate reliably with less latency. To efficiently realize the capabilities, such as ultra reliable low latency communications (URLLC), enhanced mobile broadband (eMBB), and massive machine-type communications (mMTC) offered by 5G, the next generation IoT devices/applications need a paradigm shift in their design and need to be evaluated under simulation using 5G networks before getting deployed in the real-world. However, many IoT simulators run in isolation and do not interface with real-world IoT cloud systems or support 5G networks. This isolation makes it difficult to design, develop and evaluate IoT applications for industrial automation systems and for experiments to fully replicate the diversity that exists in end-to-end, real-world systems using 5G networks. Kaala 2.0 is the first scalable, hybrid, end-to-end IoT and NextG system simulator that can integrate with real-world IoT cloud services through simulated or real-world 5G networks. Kaala 2.0 is intended to bridge the gap between IoT simulation experiments and the real world using 5G networks. The simulator can interact with cloud IoT services, such as those offered by Amazon, Microsoft, and Google. Depending on the configuration, Kaala 2.0 supports simulation of User Equipment (UE), 5G Radio Access Network (RAN) and 5G Core and at the same time support real-world User Equipment (UE), 5G Radio Access Network (RAN) and 5G Core. Kaala 2.0 can simulate many diverse IoT devices to evaluate mMTC, simulate events that may simultaneously affect several sensors to evaluate URLLC and finally simulate large amount of data to evaluate eMBB.

3. [Towards](#) an eBPF+XDP based Framework for Open, Programmable and Scalable NextG RANs, IEEE Future Networks World Forum (FNWF) 2023, USA, November 2023

Abstract:

Starting with 5G, radio access networks (RANs) are moving towards a disaggregated architecture, with most of its functionality (except for the low-level PHY layer) implemented in software. While software affords the benefits of programmability and scale-out, it is also far slower than hardware. This is further compounded by the needs for more complex, dynamic and intelligent features in Next-Generation (NextG) RANs. In this work, we advocate an eBPF (extended Berkeley Packet Filter) +XDP (eXpress Data Path) based framework for scaling and accelerating software packet processing in (O-RAN compliant) NextG RANs. Using 5G Central Unit User Plane (CU-UP) as a key case study, we present an initial design of our proposed framework, dubbed PRANAVAM, and it's the key components. We also discuss additional options for further improvements. Our preliminary evaluation results shows that PRANAVAM improves the 5G CU-UP throughput by 22-26%, compared with the existing (open-source) 5G RAN implementation.

Bio:

Udhaya Kumar Dayalan is an Engineering Manager at Trane Technologies for the past 15 years. He graduated from University of Minnesota, USA. He has filed more than 30 patents in the USA, Europe and China. He has published more than 10 papers in reputed journals in the areas of IoT, 5G and Machine Learning. He is a Member of the Advisory Panel for the Customer Experience Certificate Program at Minnesota State University, Mankato. He is a Senior IEEE Member and a Certified Systems Engineering Professional (CSEP) by the International Council on System Engineering (INCOSE). He is part of the leadership team and served as Director of Academia for the INCOSE NorthStar Chapter.



In addition to his renowned research and innovative solutions towards HVAC, IoT, 5G Networking, he has rendered his services and expertise by serving as a reviewer at numerous top IoT, Networking and Technology conferences, workshops, and forums. The organizers of this conference hold the reviewers to a high esteem as their judgments are relied upon during the rigorous process of peer reviewing. He has been invited on countless occasions to serve as a peer reviewer due to his knowledge and expertise in the field. He has been serving in the technical program committee for more than 150 conferences globally. He has served as chair and got invited as keynote speaker for several conferences.

He has prodigious accomplishments and exceptional contributions towards the field of computer science and engineering. He has received various recognitions and appraisals for his work in HVAC, IoT, 5G and Computer Networking as his research has been referenced by other experts in the field. He is an outstanding researcher with extraordinary skills who continues to exhibit excellence in the industry.

Stock Market Prediction

Stock Market Price Prediction Using ARIMA and SAP

Ketan Rathor, IEEE Senior Member, Carmel, Indiana

In the last ten years, academics have applied neural networks, one of the intelligent data mining techniques, in a variety of fields. In the modern economy, stock market data analysis and prediction play a significant role. There are two types of forecasting algorithms: linear (AR, MA, ARIMA, and ARMA) and non-linear models (ARCH, GARCH, Neural Network). In this study, we employ four deep learning architecture types to forecast a company's stock price based on historical data: Multilayer Perceptron (MLP), Recurrent Neural Networks (RNN), Long Short-Term Memory (LSTM), and Convolutional Neural Network (CNN).

The National Stock Exchange (NSE) of India and the New York Stock Exchange's day-by-day closing prices are used here (NYSE). The network was trained using the stock price of a single NSE-listed business, and it made predictions for five distinct NSE-listed and NYSE-listed companies. CNN is reportedly outperforming the other models, according to observations. Despite having been trained on NSE data, the network was able to forecast for the NYSE. This was made possible since the internal dynamics of both stock markets are similar. When the findings were compared to the ARIMA model, it was found that the neural networks outperformed the linear model at hand (ARIMA). A stock market is a venue where shares and derivatives of a corporation can be traded at a predetermined price. The stock market is based on supply and demand for shares. The stock market is one of the fastest-growing industries in any nation.

Many people nowadays are involved in this industry either directly or indirectly. Therefore, being aware of industry trends becomes crucial. People are therefore interested in stock price predictions as the stock market develops. However, because stocks are dynamic and subject to sudden swings in price, predicting stock prices is a difficult endeavor. Hence, the method which is proposed by the authors is used to properly predict the stock prices and reflect the decision on it.

SAP involves AI abilities in a few items. SAP adds brilliant usefulness (like ML) to its cloud-based asset arranging (ERP) arrangement — S/4HANA Cloud — as it means to assist clients with working on processes and answer all the more rapidly to the information tracked down in their center frameworks. AI permits end-clients to zero in on additional essential undertakings. SAP CoPilot, the computerized colleague, and bot incorporation center for the association has a twofold goal: to furnish business clients with a tomfoolery, customized insight, and shrewdly organized work information to help results. Machine talk is a successful method for speaking with machines and is an area of strength that we're at a thrilling and steadily changing stage in our lives, as well. With SAP CoPilot, we can communicate utilizing normal language with business applications. This makes for a refined, conversational involvement in SAP applications like SAP S/4HANA and SAP SuccessFactors (more to come later), as well as non-SAP applications.

Endeavor asset arranging (ERP) frameworks help associations oversee and interface day to day business processes in different fields like money (monetary examination, acquisition, bookkeeping), activities (store network the executives and arranging, stock administration), and human asset the board (labor force arranging and the executives). As business tasks become more confounded, regular ERP programming has become deficient. Man-made intelligence empowered ERP arrangements can assist organizations with smoothing out convoluted ERP processes with applications, for example, ML models and conversational computer-based intelligence frameworks. As business pioneers understand that they put more in simulated intelligence empowered ERP applications Algorithmic exchanging is a technique for executing orders utilizing mechanized pre-customized exchanging directions representing factors like time, cost, and volume. This sort of exchanging endeavors to use the speed and computational assets of PCs comparative with human brokers. In the twenty-first 100 years, algorithmic exchanging has been building up some momentum with both retail and institutional traders. It is generally utilized by speculation banks, benefits reserves, shared assets, and mutual funds that might have to fan out the execution of a bigger request or perform exchanges excessively quick for human dealers to respond to.

A survey in 2019 showed that around 92 percent of the Forex market was performed by exchanging calculations as opposed to people. The term algorithmic exchanging is frequently utilized interchangeably with mechanized exchanging framework. These include an assortment of exchanging techniques, some of which depend on equations and results from numerical money, and frequently depend on particular programming.

The analysis is that using the ARIMA moving average we can predict the prices of the stock with a very good percentage of accuracy and using the concepts of SAP this model can be deployed online for the clients to use by integrating the cloud services and making it a very versatile product.

About the Author:



Ketan Rathor has 21 years of IT Leadership experience in Project Management, Solution Architect, Digital Transformation, Analytics, Sales and Supply Chain. Ketan is an accomplished global technology industry leader with unique experience of working globally in his career from 15 countries in the world. He is passionate about building and transforming businesses, driving innovation, build and lead high-performance teams. Ketan is certified in SAP Activate Project Management, PMI-ACP, S4 HANA Sales. Ketan has bachelor's in chemical engineering and Certificate in Leadership and Change Management from IIM. He is a Senior member and is currently serving as Senior Project Manager in GyanSys Inc.

Twin Cities Report

IEEE Twin Cities Section

The Twin Cities Section has had a productive 2023.

- We presented a webinar for the 2023 Engineers Week.
- We co-sponsored a summer picnic with the Twin Cities Chapter of the IEEE Instrumentation and Measurement Society in July. A local high school First Robotics team demonstrated their robot and gave a presentation. A couple of pictures from the event are below.



- We organized a coffee and donuts social event earlier in the year.
- We organized a debate on the topic “Artificial Intelligence is Fake”. This was a hybrid meeting i.e., both in-person and online.
- We have also started a monthly webinar series and virtual coffee hours.
- We redesigned the Twin Cities Section website to make it more interesting and useful: <https://tc-ieee.org/>. We invite everyone to visit.
- Recordings from the 2023 Engineers Week webinar and the first talk in our webinar series can be found on our website here: <https://tc-ieee.org/recordings/>
- We have a second webinar, another coffee and donuts social, and our next virtual coffee hour, coming up in the next few weeks in December. Our Events and Activities calendar can be found here: <https://tc-ieee.org/events-and-meetings/>

We would be happy to see members from Region 4 joining our online activities.

Regards.

Ahmed Naumaan

Twin Cities Section Chair, 2023

Smart Village



by Bruce Howell, Region 4 Humanitarian Activities Coordinator

IEEE Smart Village (ISV) is an IEEE Foundation Priority Program whose mission is to enable and transform off-grid communities with solar power through education and the creation of sustainable, affordable, locally owned, entrepreneurial power businesses. Unlike many other humanitarian programs, ISV is run more like a business incubator than a series of direct humanitarian aid projects. Installations are based on a business plan that ensures the project will impact a significant number of people with electricity, education and jobs. While the IEEE Foundation seed funds help validate the business proposals, the local enterprises must have the vision to scale up and eventually outlive the initial support in serving their communities.

The Smart Village project was originally co-founded in 2009 by IEEE members, Ray Larsen and Robin Podmore as the “Community Solutions Initiative.” The program evolved into an entrepreneurial initiative after a 2011 project in Haiti which became the model for future off-grid solutions. The program was then renamed to “Smart Village” in 2014 after recognizing that the original mission of just addressing energy poverty by deploying solar power was insufficient to promote deep and sustainable changes. The term “Smart” in the name suggest how electricity is more than just a power source and can enrich an off-grid community with access to satellite internet service which provides off-grid populations uncensored global news, broader educations, new communication options and additional commerce opportunities.

Smart Village operates like a franchise business with standardized equipment and operating procedures coupled with a Central Global Classroom and uniform delivery systems. Uniform manuals and comprehensive training of local operators and equipment maintenance personnel plus professional pro-bono support of all products during the start-up phase provides each entrepreneur with a good foundation for success. Additionally, continuing technical support and business mentoring as the local program matures helps each micro-utility expand as needed to meet community requirements.

The IEEE Smart Village program partners with in-country, non-governmental organizations (NGO) to create self-sustaining, community-owned and -operated micro-utilities in off-grid areas. Qualified NGO partners receive sufficient seed funding to establish and demonstrate multiple installations of locally operated micro-utilities. Once technical and management competency have been demonstrated and the enterprises are on a path of self-sustainability and strong financial health, ISV works with the NGO partner again to secure funding for the expansion to hopefully achieve the goal of one million off-grid people affected by each micro-utility start-up.

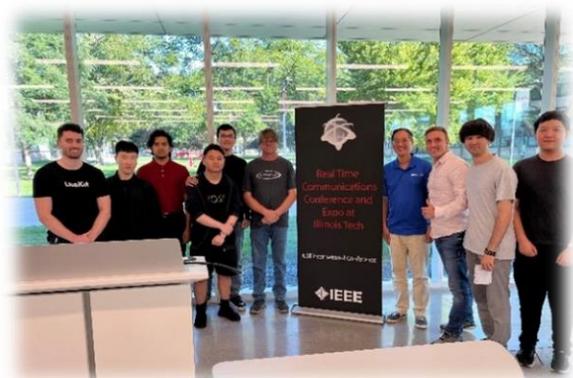
The success depends upon the entire community’s participation in the prosperity of the local electricity business and profits that are reinvested into economic development and education initiatives. To date, IEEE Smart Village has projects in 185 villages located in 13 countries, installed over 7000 PV solar panels and provides electricity affecting 350,000 lives. There are presently about 1.1 billion people living without electricity, so the growth opportunity for IEEE Smart Village is almost limitless.

Chicago Section Update

IEEE Chicago Section Q4 update



In September, IEEE Chicago sponsored the Chicago Cybersecurity Summit in Chicago where we provided complimentary registration for IEEE Chicago members. As well, IEEE Chicago was a financial sponsor of lunch for the Big Q Quantum Computing Hackathon, organized by Chicago Quantum Exchange. Chicago is serving as a hub for quantum computing, the next generation of computing where complex computational problems that would take days or weeks to run on a classical computer, can be solved in minutes and seconds. In addition, IEEE Chicago was a platinum sponsor of the IEEE Real-Time Communications Conference held at IIT, where we provided first and second cash prizes for the HackRTC hackathon and raffled an IEEE graduate student membership.





In October, IEEE Chicago sponsored the Chicago Cybersecurity Conference with an exhibit table and complimentary registration for IEEE Chicago members. In addition, IEEE Chicago celebrated its 129th anniversary since its first meeting at the Armour Institute (now IIT) on Saturday, October 14 at Loyola University Lakeshore campus, where IEEE Chicago showcased to the Chicago public what IEEE Chicago engineers do and how people can get involved. The anniversary event was started by a keynote from 2024 IEEE President-Elect Kathleen Kramer who talked about leadership for a transformative IEEE, followed by speakers from industry (Amazon, Nokia), academia (Northwestern University), startups (Windy City Lab), Chicago Engineers Foundation, IEEE-USA, and IEEE Chicago chapters such as IEEE EMC Chicago and Science Kits for Public Libraries. Attendees were able to network with exhibitors at the event, and there was a group photo of the attendees with the 2024 IEEE President-Elect in honor of IEEE Day.



IEEE Chicago was a partner in the 2024 Cybersecurity in Manufacturing at MxD where IEEE Chicago members were invited to attend presentations and talks. Chicago Section Chair Dr. Alvin Chin was a panelist in the cybersecurity in



manufacturing panel organized by John Johnson from IEEE Iowa-Illinois Section. Many students that attended the RTC 2023 conference also attended this event.



In November, IEEE Chicago had an exhibit table at The Metropolitan Club to let business club members know about our events and resources IEEE provides for technical professionals and engineers.

IEEE Chicago will have the last event of the year on December 12 at its annual Awards Banquet (back in person since 2019) at Venuti's that will present awards to the winners in the Chicago Section. IEEE Chicago had a very successful year in 2023 and we look forward to continuing that success in 2024!



Electron Structure



This comes to us courtesy of Gene Gryziecki, IEEE Life Member. This paper (see link below) questions the veracity of the Bohr theory of the hydrogen atom and accordingly, the meaning of the Bohr radius and the description of the electron. It introduces the reader to new tools first discovered over 70 years ago, but which died with the scientist until they were much later decoded by others. Using the new tools to expand the well-known mass energy equation, the reader is led by a series of equations to a mathematical description of the electron which permits an improved understanding of the Bohr radius, all in agreement with 2018 Codata values.

[*Editors Note: Makes for some intriguing reading!*]

https://globaljournals.org/GJSFR_Volume23/1-The-Toroidal-Fine-Structure.pdf

R4 Climate Initiative

Do you want to get involved in our future? As the world's largest organization of technical professionals, IEEE is uniquely positioned to help organize the world's engineers, scientists, and technical professionals in addressing the causes, mitigating impacts, and adapting to climate change.



The New R4 Climate/Sustainability Ad Hoc Committee is chartered to support and engage R4 members to address and support climate change and sustainability activities in R4 and other considerations as listed below.

- Identify and recommend new directions and initiatives to provide technical and sustainable solutions to climate change in coordination with IEEE and other OUs
- Promote climate change activities by other OUs
 - TAB - Climate Change Program, Future Directions Committee
 - SA - Planet Positive 2030
 - IEEE USA - Congress visits
 - EA – Ideathon
- Promote IEEE climate change collections and activities
 - IEEEExplore
 - Climate Change website
 - 2022-2023 IEEE Climate Change Ad Hoc Committee activities

To join us please reach out to Chanaka Hettige at chanaka@ieee.org or Vickie Ozburn at vaozburn@ieee.org

R4 Newsletter Name!

IEEE
Region4 Newsletter

Suggest us a name...

Submit

Yes, we have rejuvenated the newsletter (3 quarterly issues YTD is proof positive), but beyond that we are still looking for a very catchy and interesting name.

We have had a few submissions, but none (so far) have captured the imagination we are looking for. Yes, being creative is just as tough as determining Eigen values!

Send your suggestions to Vickie Ozburn (vaozburn@ieee.org) and Sharan Kalwani (sharan.kalwani@ieee.org)

USD AI Symposium

Advancing the Frontiers of AI: USD's Annual AI Symposium Draws Regional, National, and International Enthusiasts

The University of South Dakota (USD) proudly hosts its annual Artificial Intelligence Symposium, a flagship event uniting academia, industry, and government experts in AI and Data Science and Engineering. As a beacon of awareness in the Midwest and Region 4 of IEEE, the symposium plays a pivotal role in addressing contemporary challenges across diverse applications, including bio-healthcare, cybersecurity, quantum computing, sustainable agriculture, and risk management.



The picturesque campus of the University of South Dakota, nestled in the breathtaking landscapes of the Mount Rushmore state.

Building Bridges Across Disciplines: A Confluence of Expertise

The symposium serves as a platform where thought leaders, professionals, and researchers converge to collaboratively tackle pressing challenges in AI and data science. USD's commitment to fostering interdisciplinary collaboration is evident in the convergence of experts from academia, industry, and government. Through engaging sessions and flash talks, attendees gain insights into the latest advancements and practical applications of AI across various domains.

A Rich Legacy: From Inception to Impact

Since 2021, spearheaded by Dr. KC Santosh, Chair of the Department of Computer Science, and founder and co-chair of the symposium, the event has consistently attracted renowned speakers, fostering a culture of knowledge exchange and innovation, laying the foundation for an annual tradition that continues to thrive. The AI symposium followed the accomplishment of two successful events titled "Data Harnessing Symposium" held in 2018 and 2019.

Past symposiums have featured captivating presentations such as "Searching for Dark Matter with Machine Learning," "Using Machine Learning to Better Understand Natural Resource Dynamics," "The Role of AI in Decision-Making," and "AI is the Deal Breaker." These presentations showcased the diversity of applications and the profound impact that AI has across various domains.



Dr. KC Santosh, Chair of the Department of Computer Science and Founder/Co-Chair of the symposium, enlightening the audience with a dynamic flash talk titled "AI is your future!" at the USD's 2023 AI Symposium.

Reflecting on the history of the symposium offers valuable insights into its evolutionary journey:

- **2023:** With a total of 1422 registrations, the symposium hosted 659 participants virtually through Zoom, and 211 attendees joined in person.
- **2022:** In this dynamic year, the event saw 219 participants attending in person, complemented by 339 online participants, showcasing its reach and impact across both physical and virtual mediums.
- **2021:** Confronting the challenges of the online landscape and the pandemic lockdowns, the symposium welcomed 978 participants virtually, highlighting its resilience and continued relevance in navigating unprecedented circumstances.

These figures underscore the symposium's commitment to fostering connections, whether in-person or online, and emphasize the growing interest and participation in AI exploration. Looking forward, USD anticipates even greater engagement and collaboration in the years to come.

A Glimpse into the Future: Preparing the Next Generation

One of the symposium's key objectives is to position USD as a premier educator of AI professionals in the region and beyond. "Our AI programs at USD will contribute to preparing a workforce of young scientists who will maintain America's strategic position of command in science and engineering from South Dakota," Santosh said. By nurturing talent and fostering a culture of innovation, USD aims to maintain a leadership role in shaping the future of AI.

Elevating the Symposium Experience: Noteworthy Speakers and Networking Opportunities

In 2023, the symposium hosted IEEE Computer Science Society's 2024 President-Elect, Dr. Jyotika Athavale, as a keynote speaker. Her insights enriched the symposium, attracting over 1000 attendees and solidifying its reputation as a must-attend event. The symposium offers a unique opportunity for participants to engage with established professionals in AI, fostering connections that extend beyond the event itself.

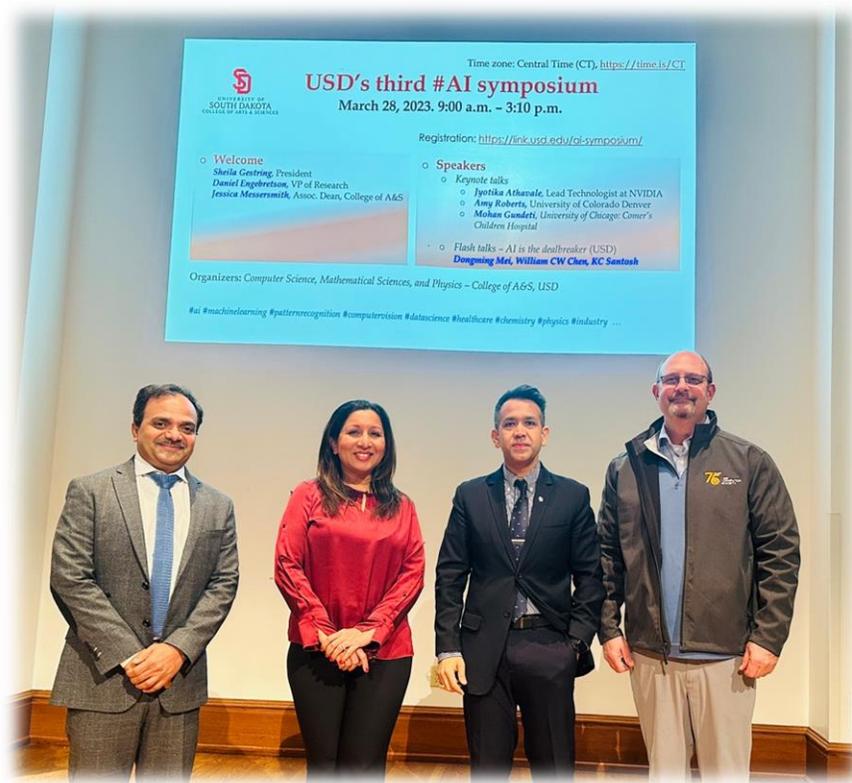


Dr. Jyotika Athavale, IEEE Computer Science Society's 2024 President-Elect, delivering an inspiring keynote at USD's AI Symposium 2023.



Dr. Mohan S. Gundeti, Chief of Pediatric Urology at the University of Chicago's Comer Children's Hospital, captivates the audience with his groundbreaking talk on 'Congenital Urological Anomalies and AI: What's the Future' at the USD AI Symposium.

Adding to the symposium's prestige, Dr. Mohan S. Gundeti, Professor and Chief of Pediatric Urology at the University of Chicago's Comer Children's Hospital, delivered an enlightening talk on "Congenital Urological Anomalies and AI: What's the Future." Dr. Gundeti's pioneering work in pediatric robotic surgery and commitment to global healthcare exemplified the symposium's convergence of medical expertise and artificial intelligence, shedding light on the future intersections of these fields. Attendees were privileged to gain insights from a luminary whose work continues to shape the landscape of pediatric urological surgery and AI integration.



Post-symposium camaraderie with (from left to right) Dr. Mohan S. Gundeti, Dr. Jyotika Athavale, Dr. KC Santosh, and Eric Berkowitz, the Director of Membership of IEEE Computer Society.

Open to All: A Free Symposium for All Enthusiasts

"In times of old, our ancestors grappled with enhancing literacy rates, but today, our mission is to raise awareness about the myriad benefits of AI tools across various domains, spanning healthcare, agriculture, and finance," explained Dr. Santosh. "In essence, AI emerges as the deal-breaker, irrespective of data sources."

USD's Artificial Intelligence Symposium stands as a testament to the university's dedication to advancing AI knowledge and fostering collaboration. By bringing together experts from diverse backgrounds, the symposium not only addresses current challenges but also contributes to shaping the future of AI. As the symposium continues to grow, its impact resonates not only within the university but across the Midwest and IEEE Region 4, solidifying USD's role as a hub for AI excellence.

Closing the Curtain: Save the Date for April 11, 2024

As we conclude this edition, we leave you with an exciting announcement to mark on your calendars. The University of South Dakota is set to host its next AI Symposium, scheduled for April 11, 2024.

Geospatial Analysis

Geospatial Analysis for Real Estate Decision-Making

Alekhya Achanta, IEEE Senior Member

I. Introduction

The real estate industry, a dynamic and ever-evolving sector, is undergoing a transformative shift driven by technological advancements. As we navigate this digital era, the role of data science and geospatial analysis, powered by Geographic Information System (GIS), emerges as a game-changer in real estate decision-making. This article delves into the significance of geospatial analysis, exploring how it shapes site selection, aids in risk assessment, and contributes to urban planning.

In the not-so-distant past, real estate developers often made decisions with limited access to comprehensive data. However, integrating GIS technology has revolutionized how industry professionals approach their work. Today, we stand at the intersection of spatial data and strategic decision-making, where location intelligence is a crucial driver for success. This article aims to unravel the layers of geospatial analysis, shedding light on its importance in guiding pivotal decisions within the real estate landscape. From identifying optimal sites for development to assessing potential risks and contributing to sustainable urban planning, geospatial analysis has become an indispensable tool for modern real estate professionals.

Join us on a journey through the geospatial landscape as we explore real-world applications, discuss the challenges, and envision the future trends that will shape how we perceive and navigate the dynamic world of real estate.

II. Importance of Geospatial Analysis in Real Estate

Analyzing spatial relationships and patterns in geospatial analysis is pivotal in the real estate industry. As properties are inherently tied to their locations, leveraging the power of geography through geospatial analysis offers unparalleled insights.

Definition and Components of Geospatial Analysis:

At its core, geospatial analysis involves examining data with a geographic or spatial component. This includes not only physical locations but also the relationships and interactions between them. Geographic Information System (GIS), a key component of geospatial analysis, serves as the technological backbone. GIS integrates spatial data, allowing professionals to visualize, interpret, and understand the significance of location-based information.

Value Addition to Real Estate:

Adopting geospatial analysis in real estate brings forth a range of benefits. It enables professionals to move beyond traditional data points and consider the spatial context of properties. For instance, understanding the neighborhood dynamics, proximity to amenities, and regional market trends becomes crucial in making informed decisions.

Evolution of Geospatial Analysis in Real Estate:

The application of geospatial analysis in real estate has evolved. Initially, maps were static, offering limited insights. With the integration of GIS technology, the ability to overlay various layers of information on maps became possible. Today, advanced analytics and machine learning algorithms further enhance the predictive capabilities of geospatial analysis, providing real estate professionals with a comprehensive toolkit for decision-making.

III. GIS (Geographic Information System) in Real Estate

In this section, we will delve into the specific role of GIS in real estate, exploring its components and showcasing real-world examples of successful implementation. The journey continues as we uncover how geospatial analysis reshapes how sites are selected for development.

Understanding GIS and its Components:

Geographic Information System (GIS) is a powerful technology that plays a central role in geospatial analysis for real estate. At its core, GIS captures, stores, analyzes, and presents geographic data, providing a platform for professionals to make informed decisions. The critical components of GIS include spatial data (information with a geographic component), hardware, software, and human expertise.

GIS technology enables the creation of dynamic, interactive maps that integrate various spatial data layers. This goes beyond simple maps; GIS allows real estate professionals to overlay information such as property boundaries, land use, demographics, and infrastructure, providing a holistic view for decision-making.

Case Studies: Successful Implementation of GIS in Real Estate

Let's explore a couple of case studies that highlight the successful integration of GIS in real estate decision-making:

Case Study 1. City Planning and Zoning:

In city planning, GIS has been instrumental in zoning analysis. By overlaying zoning regulations on a map, planners can visualize the impact of zoning laws on property use. This aids in making informed decisions about land development, ensuring compliance with local regulations.

Case Study 2. Market Analysis for Retail Expansion:

Retail businesses leverage GIS to analyze market potential before expanding into new areas. By mapping customer demographics, competitor locations, and economic indicators, retailers can identify optimal locations for new stores, enhancing their chances of success in a given market.

Benefits of GIS in Real Estate Decision-Making:

- **Spatial Visualization:** GIS enables professionals to visualize spatial relationships, making it easier to interpret complex data.
- **Improved Decision Accuracy:** Integrating various data layers in GIS enhances the accuracy of real estate decisions.
- **Efficient Communication:** GIS facilitates effective communication by presenting complex data visually and comprehensibly.

IV. Spatial Data for Site Selection

In this section, we will explore how spatial data, a fundamental component of GIS, influences site selection in real estate and contributes to strategic decision-making.

Importance of Site Selection in Real Estate:

Site selection is a critical aspect of real estate development and investment. The success of a project often hinges on choosing the correct location. Geospatial analysis, powered by GIS and spatial data, provides a comprehensive framework for evaluating potential sites.

Spatial Data's Role in Identifying Optimal Locations:

Spatial data, encompassing information about a location's physical characteristics and surroundings, serves as the cornerstone for effective site selection. Here's how spatial data contributes to this process:

- **Demographic Analysis:** Spatial data allows real estate professionals to overlay demographic information on maps. This includes population density, income levels, and age distribution, offering insights into the target market.
- **Accessibility and Infrastructure:** GIS enables mapping transportation networks, infrastructure, and accessibility factors. Evaluating proximity to highways, public transportation, and amenities becomes crucial in determining the viability of a location.
- **Environmental Considerations:** Spatial data facilitates the analysis of environmental factors such as topography, flood zones, and soil composition. This information is vital for assessing the suitability of a site and mitigating potential risks.

Case Studies: Successful Site Selection Using Geospatial Analysis

Let's explore two case studies that exemplify successful site selection through geospatial analysis:

Case Study 1. Residential Development:

A real estate developer utilized GIS to analyze spatial data related to school locations, parks, and public services. The chosen site, identified through this analysis, offered proximity to amenities and a family-friendly environment, increasing the project's appeal.

Case Study 2. Commercial Real Estate:

A retail chain employed geospatial analysis to identify locations for new stores. The company optimized its site selection strategy by considering factors such as competitor locations, consumer demographics, and traffic patterns, enhancing overall business performance.

Benefits of Spatial Data in Site Selection:

- **Data-Driven Decision-Making:** Spatial data empowers decision-makers with data-driven insights, reducing reliance on intuition.
- **Risk Mitigation:** By assessing environmental and infrastructural factors, spatial data helps mitigate potential risks associated with a chosen location.
- **Strategic Planning:** Real estate professionals can strategically plan developments based on a thorough understanding of the spatial context.

V. Risk Assessment in Real Estate with Geospatial Analysis

In this section, we will explore how geospatial analysis extends its influence on risk assessment in real estate, providing professionals with tools to navigate uncertainties successfully.

Understanding Risk in Real Estate:

Real estate investments inherently come with a degree of risk. Understanding and mitigating these risks, from market volatility to environmental hazards, is paramount for successful real estate ventures. Complemented by GIS technology, geospatial analysis is a valuable tool in the risk assessment process.

How Geospatial Analysis Aids in Risk Assessment:

Geospatial analysis enhances risk assessment in real estate by incorporating spatial data to identify and evaluate potential risks.

Here are three keyways in which this synergy unfolds:

1. Natural Hazard Mapping:

GIS technology allows for mapping natural hazards such as floods, earthquakes, and wildfires. Real estate professionals can assess the risk associated with a particular area by overlaying property locations with hazard maps.

2. Climate Change Impact Analysis:

Spatial data facilitates the analysis of climate change impacts on real estate. This includes projections for sea-level rise, extreme weather events, and temperature changes, enabling proactive risk management.

3. Market Volatility Analysis:

GIS can be employed to map market trends and fluctuations. By visualizing historical market data spatially, real estate professionals can identify patterns and anticipate market trends, allowing for more informed investment decisions.

Case Studies: Successful Risk Mitigation through Geospatial Analysis

Let's delve into two case studies showcasing successful risk assessment and mitigation in real estate:

Case Study 1. Coastal Property Development:

A real estate developer used GIS to assess coastal property development risks. By considering factors such as sea-level rise projections and storm surge potential, the developer implemented strategic measures to mitigate these risks, ensuring the investment's long-term viability.

Case Study 2. Market Trend Analysis:

A real estate investment firm employed geospatial analysis to analyze market trends across different neighborhoods. The firm optimized its investment portfolio by identifying areas with consistent growth patterns, minimizing exposure to market volatility.

Benefits of Geospatial Analysis in Risk Assessment:

- **Proactive Decision-Making:** Geospatial analysis empowers real estate professionals to make proactive decisions based on a comprehensive understanding of potential risks.
- **Enhanced Due Diligence:** GIS aids in conducting thorough due diligence by providing spatial context to risk factors, reducing uncertainties in decision-making.
- **Long-Term Sustainability:** By factoring in environmental and market risks, geospatial analysis contributes to the long-term sustainability of real estate investments.

VI. Urban Planning and Geospatial Analysis

In this section, we will explore how geospatial analysis extends its influence on urban planning, shaping the development of cities sustainably and efficiently.

The Role of Geospatial Analysis in Urban Planning:

Urban planning, a complex and multifaceted discipline, is significantly enhanced by integrating geospatial analysis. With its ability to process and analyze spatial data, GIS technology becomes a powerful tool for city planners and policymakers.

Key Contributions to Sustainable Urban Development:

1. Land Use Planning:

GIS facilitates mapping existing land uses, allowing planners to visualize the distribution of residential, commercial, and industrial zones. This aids in optimizing land use and ensuring efficient urban development.

2. Infrastructure Planning:

Spatial data is crucial for planning infrastructure projects. By mapping existing infrastructure and analyzing spatial relationships, city planners can identify areas needing improvement and strategically plan new developments.

2. Transportation Planning:

GIS plays a crucial role in optimizing transportation systems. From mapping traffic patterns to planning public transportation routes, geospatial analysis contributes to efficient and sustainable urban mobility.

Case Studies: Successful Urban Planning with GIS

Let's explore two case studies showcasing successful urban planning initiatives powered by geospatial analysis:

Case Study 1. Smart Growth Initiative:

A city implemented a smart growth initiative using GIS to identify areas suitable for high-density development. By considering factors such as accessibility to public transportation and existing infrastructure, the city promoted sustainable urban growth.

Case Study 2. Green Space Planning:

GIS technology was employed to plan and allocate green spaces within an urban area. By mapping existing parks, analyzing population density, and considering environmental factors, city planners optimized green space distribution to enhance the overall quality of life.

Benefits of Geospatial Analysis in Urban Planning:

- **Data-Driven Decision-Making:** Geospatial analysis provides data-driven insights, enabling city planners to make informed decisions for sustainable urban development.
- **Community Engagement:** Visual representations created through GIS technology facilitate effective communication with the public, fostering community engagement in the planning process.
- **Resilient Cities:** By identifying and mitigating potential challenges through spatial analysis, cities can become more resilient to environmental and demographic changes.

VII. Challenges and Considerations

This section will explore the challenges associated with implementing geospatial analysis in real estate and urban planning, addressing ethical considerations and privacy concerns.

Challenges in Implementing Geospatial Analysis in Real Estate and Urban Planning:

While geospatial analysis brings immense value to decision-making processes, its implementation is challenging. Acknowledging and addressing these challenges is crucial for ensuring geospatial technology's responsible and effective use.

1. **Data Quality and Accuracy:** The reliability of geospatial analysis depends on the quality and accuracy of the underlying spatial data. Only accurate or updated information can lead to sound conclusions and decisions.
2. **Privacy Concerns:** Geospatial analysis often involves location data, raising privacy concerns. Striking a balance between utilizing location information for analysis and protecting individual privacy is a persistent challenge.
3. **Technical Expertise:** Implementing geospatial analysis requires technical expertise in GIS and related technologies. Access to skilled professionals and training opportunities is essential for successful integration.
4. **Interoperability:** Ensuring interoperability between different GIS systems and data formats can be challenging. Incompatibilities may hinder the seamless exchange of spatial data.

Ethical Considerations and Responsible Use:

Addressing ethical considerations is paramount in the responsible use of geospatial analysis:

1. Transparency:

Open and transparent communication about the use of geospatial analysis helps build trust among stakeholders. Clearly articulating how spatial data is used and ensuring transparency in decision-making processes is essential.

2. Bias and Fairness:

Geospatial analysis can inadvertently perpetuate biases present in the data. It is crucial to actively identify and mitigate biases to ensure fair and equitable decision-making.

3. Community Engagement:

Involving the community in the decision-making process is essential. Soliciting input and feedback from residents ensures that the use of geospatial analysis aligns with the needs and values of the community.

VIII. Future Trends in Geospatial Analysis for Real Estate

The landscape of geospatial analysis for real estate is continually evolving, driven by technological advancements. Several emerging trends are poised to shape the future of how spatial data is utilized in decision-making processes:

1. *Integration of Artificial Intelligence (AI)*: AI algorithms, when integrated with geospatial analysis, can enhance predictive capabilities. Machine learning models can analyze vast datasets, identify patterns, and provide more accurate insights for real estate professionals.
2. *Augmented Reality (AR) in Property Visualization*: AR applications can revolutionize property visualization. Real estate professionals and clients can use AR to overlay property information onto the physical environment, allowing for immersive and interactive experiences.
3. *Blockchain for Transparent Transactions*: Blockchain technology can enhance transparency and security in real estate transactions. Smart contracts and decentralized ledgers can streamline the process, reducing fraud and ensuring the integrity of property records.

Advancements in GIS Technology:

GIS technology will continue to advance, offering new functionalities and capabilities,

1. *3D Mapping and Visualization*: Integrating 3D mapping technologies within GIS platforms allows for more realistic and immersive visualizations. This is particularly valuable for urban planning and architectural design.
2. *Real-Time Data Integration*: GIS platforms increasingly incorporate real-time data feeds, enabling real estate professionals to access the latest information on market trends, traffic patterns, and other dynamic factors.

The Role of Data Ops Engineers in Managing Geospatial Data:

Data ops engineers play a crucial role in ensuring the effective management of geospatial data for real estate applications:

1. *Data Quality Assurance*: Data ops engineers are responsible for maintaining the quality and accuracy of geospatial datasets. Regular audits and validation processes ensure that the spatial data used in the analysis is reliable.
2. *Interoperability Management*: Ensuring that geospatial data seamlessly integrates with different systems requires expertise in interoperability. Data ops engineers work to bridge gaps between various GIS platforms and data formats.
3. *Security and Compliance*: Data ops engineers implement robust security measures to protect geospatial data from unauthorized access. They also ensure compliance with data protection regulations, addressing privacy concerns associated with location-based data.

IX. Conclusion

As we conclude this exploration into the realm of geospatial analysis for real estate decision-making, it becomes evident that the fusion of technology and spatial data is reshaping the industry. From site selection and risk assessment to urban planning, GIS technology has become indispensable, offering once unimaginable insights.

Throughout this journey, we've highlighted the crucial role of geospatial analysis in real estate. It provides a lens through which professionals can analyze spatial relationships, assess risks, and plan for sustainable urban development. The integration of GIS technology enhances decision-making processes and contributes to the long-term viability and resilience of real estate investments.

Looking ahead, the transformative potential of GIS technology continues to unfold. Emerging trends, such as the integration of AI, augmented reality, and blockchain, promise to elevate geospatial analysis capabilities. These advancements and ongoing improvements in GIS technology will empower real estate professionals to make more informed, data-driven decisions.

Call to Action:

As we embrace the future of geospatial analysis in real estate, industry professionals need to leverage these technologies responsibly. Transparency, ethical considerations, and community engagement must remain in decision-making processes. Doing so can foster a more sustainable and equitable real estate landscape.

Data ops engineers play a pivotal role in the dynamic intersection of data science and real estate. Their expertise in geospatial data ensures its quality, interoperability, and security. As we navigate the evolving landscape, the collaboration between data ops engineers and real estate professionals will be vital to unlocking the full potential of geospatial analysis.

Closing Thoughts:

Geospatial analysis is not merely a tool; it's a catalyst for innovation and informed decision-making in the real estate industry. As we embrace technological advancements, let us do so with a commitment to ethical practices, transparency, and a vision for a more resilient and data-informed future.

Thank you for accompanying us on this exploration of geospatial analysis in real estate. May your future endeavors be guided by the power of spatial data, enabling you to navigate the complexities of the real estate landscape with confidence and insight.

Author's Bio:

Alekhya Achanta is an accomplished data professional with 7+ years of diverse experience in data analysis, data ops engineering, business intelligence, and QA analysis. As a thought leader, she leverages data-driven insights for problem-solving and process optimization. With a curious mindset, Alekhya excels in uncovering valuable insights from complex datasets, driving innovative solutions. Her successful tenure at Tata Consultancy Services showcases automation expertise, excellent reporting skills, and client satisfaction. As a skilled DataOps Engineer at Continental Properties, she builds robust data pipelines, creates interactive dashboards, and fosters collaboration. Alekhya's passion for education is evident as a STEM tutor, nurturing learning environments. With a Master's in Data Science, she earned prestigious awards from TCS multiple times and 50+ appreciations for her impact on data engineering and business intelligence at Continental Properties. She can be reached at alekhya.achanta23@ieee.org

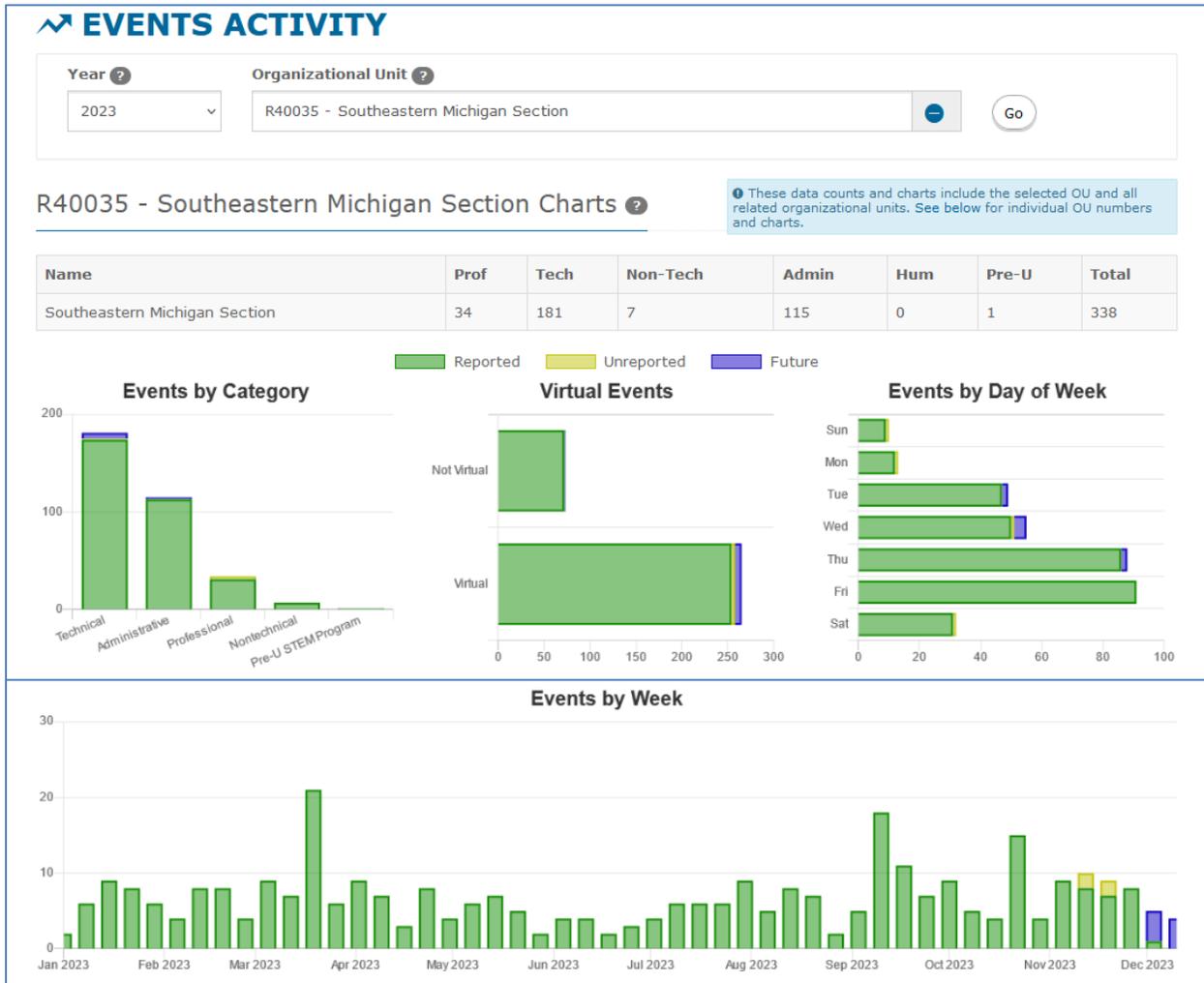


Motivation - "As a DataOps engineer at Continental Properties Company Inc., a real estate development company, my motivation behind exploring geospatial analysis for real estate decision-making lies in its promising potential to revolutionize our industry. Geospatial data offers a unique lens through which we can gain valuable insights into property dynamics, market trends, and strategic planning. Despite having little experience in this domain, I am intrigued by the transformative impact of geospatial analysis on optimizing resource allocation, identifying lucrative opportunities, and mitigating risks in real estate development. The article submitted to the IEEE newsletter aims to initiate a conversation within the community about the untapped potential of geospatial analysis. It provides a fresh perspective on how it could reshape decision-making processes within our field."

SE Michigan Update

IEEE Southeastern Michigan Section 2023 YTD Update

It has been yet again a banner year for our Section. We exceeded our 2022 achievements by a whopping 50 total events (out of which 37 were technical). Presented below is the vtools graph for the section and it may look difficult to beat in 2024!



Reflecting upon 2023, we continued our series of technical and historical documentaries. We were delighted that they received positive reviews all around. Inevitably, like every virtual event, we often encountered technical internet glitches, but we repeated a few of them, so those who missed out – could enjoy them. As always, we invite suggestions from those who attended to let us know of other tech documentaries they may like to see.

We continued our good working relationships with industry and plan to try to increase it a bit. Some of the successes in 2023 were the Embedded Systems Workshop 2023 (the 21st edition), the Embedded Systems hands-on session (3rd edition). Attached in this article are two pictures (one from each event).



Participants in the Embedded systems Workshop 2023



*Participants in the Hands-On Embedded Systems Workshop 2023
Theme: Brushless DC Motor Control*

The EMC chapter in Southeastern Michigan is one of the most active globally and they conducted several hands on workshops as well as a superbly attended EMCFest. See their website for more details, but we are sharing a few pictures here. Besides that, they were 100% key to the recent EMC 2023 Global Symposium.



Southeastern Michigan Section does not do pure technical events, we held a summer picnic as well and had folks join us from the furthest corners of the geographic area. Members joined with their families and a good time was had by all.



Another major effort put in by the Section in cooperation with several WiE groups and Region 4 was the WiE leadership Summit, which you can read about elsewhere in this issue.

Coming back to technical events, upon review we hosted almost a *dozen distinguished speakers* and did a good number of joint events with other chapters - both within the Section, with other Sections and with both chapters/sections in other IEEE regions.

Another very active chapter is our Robotics Society chapter. Every year (in cooperation with several local organizations including Lawrence technological University – LTU) they hold a global [Robofest](#).



For the support we have been doing locally towards Robofest, the Section was recognized by the LTU. Attached is the plaque (given in the following year). So, for 2023 we will be getting another one in 2024. I forget how many years we have been supporting Robofest, but letting folks know is long overdue! See the picture below to get an idea of the popularity.



Another event which members enjoyed was the 60th Anniversary celebration of our Section. It was held at the Flint Institute of Art (a hidden gem I might add!). We plan on holding regular events there – due to its vast collections as well as geographically it is centrally located to all our members. Speaking of which we honored several of our section members for their service to the community. Our keynote speaker was John Verboncoeur, Vice President of IEEE TAB (Technical Activities Board), pictured below. Members recognized were Subra Ganesan, Mohamad Berri and Mike Anthony. John spoke the coming challenges facing IEEE in the years beyond and how IEEE is adapting, plus the various Initiatives in flight.

Of course, there were many more events that one could write about, but we may run out of room here, so looking forward to an equally fruitful 2024!



IEEE Day – IEEE Cares

IEEE Cares – A Celebration of IEEE Day

For IEEE Day 2023, the Northwest Subsection of the Chicago Section took the occasion to both recognize the past and look into the future. Seizing on the opportunity to introduce non-members to IEEE, NWSS staged a program which honored the illustrious past of IEEE and its predecessor societies and the day almost one hundred and fifty years ago when engineers met to develop the framework for sharing technical information which would become IEEE. But in addition to paying homage to history, NWSS took this opportunity to highlight the ways in which IEEE was using technology to make the world a better place. From the elevation of the Humanitarian Activities Committee to board status to formation of SIGHT (Special Interest Group on Humanitarian Technology) NWSS carefully outlined the purpose and operation of each of the humanitarian activities which are part of IEEE.

In addition to a presentation by Connie Kelly, Region 4 Director elect 2023-2024 and longtime member of the IEEE SIGHT Steering Committee, attendees were treated to a firsthand discussion of preparing an EPICS in IEEE proposal and completing the work outlined in the proposal when the grant was awarded, by Epiphany Sosa, who worked on the project.

The number and span of the various IEEE Humanitarian programs is testament to the fact that IEEE truly does care.



Region 4 Director-Elect

Call for Nominations for 2025-2026 IEEE Region 4 Director-Elect

The Region 4 nominating committee and its chair Johnson Asumadu, are seeking nominations for the positions of 2025-2026 Director-Elect. This is a six-year commitment: two-year term as Region Delegate/Director Elect, a two-year term as Region Delegate/Director, and a two-year term as Past Region Delegate/Director.

Deadline for Nominations is 31 October 2023

Region Delegate/Directors represent the membership of their Region in the IEEE Assembly ([Section I-200 of the IEEE Bylaws](#)) as a voting delegate. In addition, Region Delegate/Directors are voting members of the Member and Geographic (MGA) Board and MGA Assembly as a voting delegate. Those Region Delegate/Directors in Region 1-6 are also voting members of the IEEE-USA Board and IEEE-USA Assembly.

Eligibility

Candidate shall reside in the Region, be a Member in good standing, and a Senior Member Grade or higher. It is highly recommended that the candidate has experience in regional activities, either through participating in the Regional Committee or Chair of Section/Committee. The candidate should know IEEE beyond the limits of his/her section.

How to Nominate

To self-nominate for the position, contact Johnson Asumadu at j.a.asumadu@ieee.org or +1(269) 377-9801. To nominate a colleague refer them to Johnson Asumadu at j.a.asumadu@ieee.org or +1(269) 377-9801

For information about the position, including additional responsibilities and estimates of the time required during the term of office, review the [Member, IEEE Board of Directors](#) and [Director Position Descriptions](#).

R4 Media Sites

Region 4 Website

<https://www.ewh.ieee.org/reg/4/index.php>

Each of the sites below may be accessed through the Website:

R4 Event Calendar

<https://www.ewh.ieee.org/reg/4/calendar.php>

R4 Facebook Page

<https://www.facebook.com/R4.IEEE/>

R4 LinkedIn Page

<https://www.linkedin.com/company/ieeer4/>

R4 Twitter

<https://twitter.com/IEEER4>

R4 Instagram

<https://www.instagram.com/ieeer4/>

R4 YouTube Channel

<https://www.youtube.com/@IEEER4>

R4 Committee Members:

For a complete listing of all:

<https://www.ewh.ieee.org/reg/4/committee.php>