

Dr. J. Scott Goldstein

EDUCATION

Ph.D., Electrical Engineering, University of Southern California, Los Angeles, CA, 1997
Thesis: *Optimal Reduced-Rank Statistical Signal Processing, Detection and Estimation*

Advisor: Dr. Irving S. Reed

MSEE, Electrical Engineering, George Mason University, Fairfax, VA, 1992
Thesis: *The Transient Characteristics of Adaptive Filter Structures in Constrained Adaptive Array Sensor Processing*

Advisor: Dr. Harry L. Van Trees

BSEE, Electrical Engineering, George Mason University, Fairfax, VA, 1989

SECURITY CLEARANCE: TS/SCI with current SSBI and Polygraph

PROFESSIONAL EXPERIENCE SUMMARY

Dr. Goldstein is an Assistant Vice President at SAIC and has over 17 years of experience in the fields of radar, sonar, communications, navigation, and imaging sensors. He has performed fundamental research and development in the technical areas that support C3I and ISR functions. He has also directly influenced the development of new programs within DARPA, the national intelligence community and the individual military services. In his current position, Dr. Goldstein manages over twenty engineers, four branch managers, and two administrative staff members. In addition, he provides technical leadership in a number of classified programs developing advanced sensor systems.

Previously, Dr. Goldstein led a complex program at MIT Lincoln Laboratory, where he brought together the capabilities of two Defense agencies, three DoD service laboratories and one university to successfully develop a novel product for the intelligence community. He also was one of three principals leading an in-house program on the detection of underground facilities and participated in classified sensor programs while at MIT Lincoln Laboratory. Prior to this, Dr. Goldstein served as the Vice-President and Chief Scientist of Adaptronics, Inc., was a Shackelford Fellow with the Radar Systems Division at the Georgia Tech Research Institute, worked on sensor programs at the Institute for Defense Analyses, and was a consultant to the Army Research Laboratory.

Dr. Goldstein is a Fellow of the IEEE and a member of the IEEE Radar Systems Panel. He is an Adjunct Professor of Electrical Engineering at Virginia Tech, where he is advising two Ph.D. candidates and teaching courses on radar systems and signal processing. He has authored or co-authored over 100 technical publications.

Dr. Goldstein is also a reserve officer in the U.S. Air Force, where he has had a significant impact on the development of advanced sensor systems for both DoD and the intelligence community. His present assignment is to the National Reconnaissance Office, where he is the Deputy Chief of the Hard Targets Branch within the Advanced Systems and Technology Directorate. Dr. Goldstein has over 19 years of military service.

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DETAILED PROFESSIONAL EXPERIENCE

Assistant Vice President

Senior Scientist and Manager, Adaptive Signal Exploitation SAIC, Chantilly and Arlington, VA (1999-present)

Founded and currently leading an Intelligence, Surveillance and Reconnaissance organization composed of 4 branches: Radar/IMINT; Communications/SIGINT; Spectral/MASINT and Sonar/Acoustics. Developed broad sponsor base and generated funding to support the organization.

- Responsible for the conception, development and management of advanced signal processing efforts in the areas of detection, estimation and classification using radar, sonar, communications and imaging sensors.
- Responsible for the technical leadership and management of a staff composed of over 20 engineers and scientists.
- Directly contributes to the development, technical execution and management of classified IMINT, SIGINT and MASINT programs to support the intelligence community, numerous sensor signal processing programs to support DARPA, and advanced technology programs for the individual services.

Adjunct Professor

Bradley Department of Electrical and Computer Engineering Virginia Polytechnic Institute and State University (VA Tech) Northern Virginia Campus (2000-present)

- Supervisor and principal advisor for two doctoral candidates.
- Organizing courses in advanced statistical and adaptive signal processing.
- Instructor for EE 5635, Radar Systems Analysis and Design and EE 5636, Advanced Radar Theory.

Staff Member

MIT Lincoln Laboratory, Lexington, MA (1998-1999)

- Program manager for Advanced Target Detection and Identification. Responsible for managing program that included two Defense agencies, the Army National Ground Intelligence Center, Navy SPAWARSCEN, Air Force Research Laboratory and one university.
- Principal participant on an in-house program for the detection of underground facilities.
- Participant on programs concerned with signal processing applications of radar.

Vice-President and Chief Scientist

Adaptronics, Inc., Atlanta, GA (1994-1997)

- Responsible for technical oversight of the company.
- Principal Investigator for *Adaptive Subband Decompositions for Arbitrary Time-Frequency Tilings*, Sponsored by the USN Naval Air Warfare Center under contract N0024-95-C-0257.
- Principal Investigator for *Adaptive Radar ECCM*, sponsored by the USAF Wright Laboratory (AFMC) under contract F33615-94-C-1536.

Consultant

Adaptive Sensors, Inc., Santa Monica, CA (1997)

Provided technical consulting services on adaptive radar signal processing and reviewed legal patent case involving magnetic anomaly detection.

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Research Assistant

University of Southern California, Department of Electrical Engineering, Los Angeles, CA (1995-1997)

- Organized and co-led with Prof. Irving Reed both a research group and the Statistical Signal and Image Processing Laboratory. The Laboratory had 6 Ph.D. students, 2 professors and 1 post-doc associated with it.
- Authored research proposals which successfully resulted in contracts with the National Science Foundation (MIP), the CIA-NSA (ORD-funded) Center for Research on Applied Signal Processing (CRASP), and the U.S. Air Force (2 contracts).
- Responsible for research in areas of reduced-rank statistical signal processing, detection, estimation and classification; communications theory; and image/speech processing and coding.

Consultant

Army Research Laboratory, Aberdeen Proving Ground, MD (1994-1996)

Responsible for providing technical consulting services on adaptive signal processing and image processing efforts under contracts DAAL01-94-P-2484, W71B7J-95-P-0513 and DAAL01-96-P-0771.

Shackelford Fellow

Georgia Institute of Technology, Atlanta, GA (1992-1995)

- Affiliated with the Radar Systems Division of the GTRI Sensors and Electromagnetic Applications Laboratory.
- Co-Principal Investigator of internal research effort on advanced radar signal processing.
- Responsible for research on statistical signal processing, sensor array processing, detection and estimation theory.
- Contributed to proposals that successfully resulted in contracts from DARPA and the US Air Force.

Staff Member

Institute for Defense Analyses, Alexandria, VA (1986-1992)

Primary tasks for the Office of the Secretary of Defense and the Joint Staff included:

- European Theater Air Command and Control System. Responsible for the technology assessment of multi-sensor detection and fusion from homogeneous and heterogeneous sensors.
- Identification: Friend, Foe, or Neutral Joint Test Program. Responsible for supervising the tech support contractor's assessment of data validity and for the selection of methodologies for further analysis of data collected by the IFFN testbed.
- Tactical Missile Defense Sensors. Responsible for the comparison and selection of current and planned improvements of current sensor systems to undertake an anti-tactical ballistic missile role.

Reserve Officer in the United States Air Force (1990-present)

Deputy Chief, Hard Targets Branch, Advanced Systems and Technology (AS&T) Directorate, National Reconnaissance Office, Washington, DC (2001-present)

First Air Force reserve officer formally assigned to the NRO.

- Responsible for planning the implementation of R&D for advanced, Presidential priority, intelligence requirements; providing capability analyses for future sensor systems; and interfacing with DoD agencies, the intelligence community and the individual services.
- Member of the NRO / Intelligence Community PROTEUS Panel to explore potential problems, solutions and strategies for the Intelligence Community in the year 2020.

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- NRO/AS&T representative to the Military Exploitation of Reconnaissance and Intelligence Technology (MERIT) working group.

National Security Space Architect (NSSA), Fairfax, VA (2001-present)

NRO/AS&T representative to the NSSA, tasked with technology assessment and architecture studies for space-based radar and wide area surveillance.

Air University, College of Aerospace Doctrine, Research and Education (CADRE), Maxwell AFB, AL (2001)

Selected for membership on the Air University Advanced Research Team within CADRE. Tasked to assist in the development of future space doctrine. This is an additional duty while assigned to the NRO.

Action Officer, Air Staff, Pentagon, Washington, DC (2000)

Assigned to HQ USAF/SC working tactical airborne and space communications issues.

Project Engineer, National Reconnaissance Office, Washington, DC (1998-2000)

Attachment from AFRL to the Advanced Systems and Technology (AS&T) Directorate. Member of study team working the pre-acquisition stages of classified satellite programs.

Senior Systems Manager for Intelligence and Information Processing, Air Force Research Laboratory, Rome, NY (1997-2000)

Responsibilities included directing and performing research on next generation detection, estimation, target classification and ECCM techniques for ground-based, airborne and space-segment sensor systems; developing and leading in-house research effort on statistical signal processing and image transmission; and directing contractor's research and analysis efforts for specific signal processing programs.

Vice-Chairman, SAR/SLAR International Steering Committee, SAF/AQIJ, Washington, DC (1996-1999)

Member of the synthetic aperture radar/side-looking airborne radar (SAR/SLAR) steering committee, whose nation-members include the U.S., the U.K., Germany and Canada. This was an additional duty while assigned to AFRL.

Project Engineer, GPS Joint Program Office, Los Angeles, CA (1997-1998)

Member of study team responsible for the design of adaptive interference mitigation for GPS receivers on airborne platforms and high precision weapon systems. This was an additional duty while assigned to AFRL.

Program Manager for Military Satellite Communications, Rome Laboratory, Rome, NY (1994-1997)

Responsibilities included directing and performing research on communications systems and providing a multidisciplinary perspective to adaptive signal processing in communications and radar; leading in-house research effort on space communications; and directing contractor's research and analysis efforts for specific space communications and signal processing programs.

Electrical Engineer and Project Leader for Signal Processing, Rome Air Development Center and Rome Laboratory, Rome, NY (1991-1994)

Responsibilities included performing research on next generation signal processing techniques to support DoD sensor programs and directing contractor's research and analysis efforts for specific signal processing programs.

Staff Officer, Air Staff, Pentagon, Washington, DC (1990-1991)

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Assigned to the Deputy Chief of Staff, C4 while mobilized to active duty in support of Desert Shield and Desert Storm. Responsible for MILSATCOM requirements, technology development, and satellite employment strategy. Author of Air Force chapter of the Joint Integrated Satellite Requirements Document (ISR/D).

Project Engineer, Advanced Development Section, Beam Control Branch, Laser and Imaging Directorate, Phillips Laboratory and Air Force Weapons Laboratory, Kirtland AFB, NM (1990-1991)

Responsible for the theoretical development, design and implementation of stochastic control systems for acquisition, tracking and pointing from space-based platforms. Responsible for research and development of advanced tracking algorithms and systems to support the Air Force Ground Based Laser Anti-satellite Program and the SDIO. Directed contractor's research for specific advanced tracking programs.

Project Engineer, Theater Air Command and Control Simulation Facility, Tactical Air Warfare Center, Tactical Air Command, Kirtland AFB, NM (1990)

Project Engineer and member of technical management team responsible for an operational test evaluating both the utility of employing flexible SAM and fighter options for Allied Air Forces Central Europe and various operational tactics and procedures for protecting a High Value Airborne Asset platform; in this case a Joint STARS aircraft, for the Air Force Operational Test and Evaluation Center. This was an attachment from Air Force Weapons Laboratory.

Enlisted and commissioned service in the United States Army Reserve (1981-1990)

Branch qualified infantry and signal as an officer. Served as an Infantry Platoon Leader and Signal Staff Officer. Honorable discharge as staff sergeant (E-6) with MOS in infantry, ordnance and intelligence. Honor graduate of AIT and OCS.

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AWARDS AND HONORS

- IEEE Fellow with citation “*For contributions to adaptive Wiener filter theory and its application to radar and communications.*”
 - IEE Clarke-Griffith Memorial Paper Award and Premium for *A multidisciplinary perspective on adaptive sensor array processing* (co-authored with I.S. Reed, X. Yu, and P. Singer), which appeared in the IEE Proc.-Radar, Sonar Navig., Vol. 146, No. 5, pp. 221-234, October 1999.
 - SAIC Corporate Excellent Performance Achievement Award to top 1% of all SAIC employees (1999 and 2001).
 - SAIC Group “Rainmaker” Award for technical excellence and business development (1999 and 2000).
 - SAIC Corporate Cooperative Business Building Award for working closely with other SAIC elements (2001).
 - Sigma Xi Scientific Research Honor Society
 - Tau Beta Pi Engineering Honor Society
 - Eta Kappa Nu Electrical Engineering Honor Society
 - IEEE Aerospace and Electronic Systems Society EASCON Award
 - Japanese Okawa Foundation Research Grant (\$10,000 US)
 - Air Force Research Laboratory Reservist of the Year (1998)
 - Air Force Electronic Systems Center IMA Officer of the Year (1994)
 - Air Force Systems Command IMA Officer of the Year (1992)
 - Air Force Systems Command Reserve Junior Officer of the Year (1991)
 - Air Force Award for Scientific Achievement (over 15 cash awards)
 - Shackelford Fellow, Georgia Tech Research Institute
 - AFCEA International Postgraduate Fellowship
 - AFCEA International Meritorious Service Award
 - AFCEA International Distinguished Young AFCEAN Award
 - AFCEA Northern Virginia Chapter Competitive Scholarship
 - Washington Society of Engineers’ Young Engineer’s Award
- Military decorations include the Meritorious Service Medal, Air Force Commendation Medal with oak leaf cluster, Army Commendation Medal, Air Force Achievement Medal, Army Achievement Medal, Joint Meritorious Unit Award, Armed Forces Reserve Medal with mobilization device, and the Small Arms Expert Marksmanship Ribbon with bronze star.

PATENTS

1. **System and Method for Linear Prediction**, serial number 60/239,931, filed October 13, 2000 (with Hanna Witzgall).
2. **System and Method for Adaptive filtering**, serial number 60/228,408, filed August 29, 2000 (with D.C. Ricks).
3. **Self-Synchronizing Adaptive Multistage Receiver for Wireless Communication System**, serial number 09/883,835, filed June 18, 2001 (with I.S. Reed, P. Thanyasrisung and T.K. Truong).

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PROFESSIONAL ACTIVITIES

Federal & Technical Panels / Committees:

- Member, IEEE Fellow Selection Committee. 2002
- Invited briefing to the JASONs Fall Meeting on Advances in Detection and Estimation, Nov. 2001.
- Member of the DARPA Special Projects Office Red Team for Space-Based Radar. 2001-date.
- Member of the NRO PROTEUS Panel to explore potential problems, solutions and strategies for the Intelligence Community in the year 2020. 2001.
- Member, IEEE Radar Systems Panel. 1999-date.
- Member, National Science Foundation Signal Processing Panel. 1999-2000.
- Subject matter expert, National Imagery and Mapping Agency Pathfinder on automated feature extraction and automatic target identification. 1999.
- Member of U.S. Delegation and Vice Chairman, SAR/SLAR International Steering Committee (US-UK-CA-GE). 1996-1999.
- Co-Chairman, STAP / Radar Data and Signal Processing, IEEE Radar Conference, 2002.
- Technical Committee Member, 10th IEEE Workshop on Statistical Signal and Array Processing, 2000.
- Chairman, Radar Signal Processing, 10th IEEE Workshop on Statistical Signal and Array Processing, 2000.
- Technical Committee Member, IEEE International Radar Conference, 2000.
- Chairman, Adaptive Signal Processing, IEEE MILCOM, 1994-1998.
- Chairman, Statistical Signal and Image Processing, IEEE Dual-Use Tech. and Applications Conference, 1994-1995.
- Chairman, Northern Virginia / Washington, DC Joint Chapter of the IEEE Control Systems Society. 1990-1992.
- Chairman, IEEE Region 2 Technology Policy Committee. 1991-1992.
- Steering Committee Member, IEEE Workshop on Networks for the Coming Information Age. 1989.

Organizational Activities:

- Chairman, IEEE Northern Virginia Section Fellow Committee. 2001-present.
- Chairman, IEEE Northern Virginia Section Senior Member Nomination Committee. 2001-present.
- Chairman (1992), Vice Chairman (1991-1992 and 2002), Treasurer (1990-1991), Secretary (1989-1990) and Director (1989 and 2001), Northern Virginia Section of the IEEE.
- Vice-Chairman, Northern Virginia Section of the IEEE PACE Committee. 1989-1992.
- Chairman, George Mason University Student Branch of the IEEE. 1988-1989.
- Member, AFCEA International Young AFCEAN Advisory Council. 1990-1992.
- Member, AFCEA International Awards Committee. 1991-1992.
- Member, AFCEA International Membership Committee. 1991-1992.
- Chairman, Young AFCEAN Committee, Northern Virginia Chapter of AFCEA. 1989-1991.
- President, George Mason Chapter of AFCEA. 1987-1988.
- President (1990) and Vice President (1989), Iota Mu Chapter of Eta Kappa Nu.
- Life Member, Armed Forces Communications and Electronics Association.
- Life Member, Air Force Association.
- Life Member, Reserve Officers Association of the United States

Tutorials:

- Presented tutorial “Reduced Rank Adaptive Filtering and Applications” at the 2001 IEEE International Conference on Acoustics, Speech and Signal Processing (with Mike Zoltowski).
- Presented tutorial “Space-Time Adaptive Processing II – Advanced STAP” at the 2002 IEEE Radar Conference (with Irving Reed).

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- Presented tutorial “Space-Time Adaptive Processing II - Applications and Real World Considerations” at the 2000 IEEE International Radar Conference (with Joe Guerci and Irving Reed).
- Presented tutorial on Space-Time Adaptive Processing (STAP) at the 1998 IEEE Radar Conference (with Jim Ward).
- Presented tutorial on Space-Time Adaptive Processing (STAP) at the 1997 IEEE Radar Conference (with Irving Reed).

MAJOR PUBLICATIONS

Books and Book Chapters:

1. J.S. Goldstein, **The multistage Wiener filter**, in *The Applications of Space-Time Adaptive Processing*, edited by R. Klemm, IEE Press, Oxford, UK, to appear 2003.
2. J.S. Goldstein, I.S. Reed and L.L. Scharf, **A new method of Wiener filtering**, in *Defence Signal Processing*, edited by D. Cochran, B. Moran and L. White, Elsevier Science Press, Oxford, UK, 2002.
3. J.S. Goldstein, J.R. Guerci, and I.S. Reed, **Reduced-rank intelligent signal processing with application to radar**, Chapter 12 in *Intelligent Signal Processing*, edited by S. Haykin and B. Kosko, IEEE Press, New York, NY, 2001.

Refereed Journal Articles:

1. H.E. Witzgall and J.S. Goldstein, **Reduced-rank spectrum estimation with ROCKET**, *IEEE Transactions on Signal Processing*, in preparation.
2. H. Nguyen, J. Vance and J.S. Goldstein, **A reduced-rank image formation technique for synthetic aperture radar**, *IEEE Transactions on Geoscience and Remote Sensing*, in preparation.
3. P. Thanyasrisung, I.S. Reed, X. Yu and J.S. Goldstein, **Reduced-rank adaptive detection and recognition of resolved targets**, *IEEE Transactions on Signal Processing*, submitted 2001.
4. I.S. Reed, P. Thanyasrisung, J.S. Goldstein, T.K. Truong and C. Hu, **A self-synchronizing adaptive multistage receiver for CDMA systems**, *IEEE Transactions on Information Theory*, submitted, 2001.
5. M.L. Honig and J.S. Goldstein, **Adaptive reduced-rank interference suppression based on the multistage Wiener filter**, *IEEE Transactions on Communications*, to appear, 2001.
6. D.A. Garren, M.K. Osborn, A.C. Odom, J.S. Goldstein, S.U. Pillai and J.R. Guerci, **Enhanced target detection and estimation via optimized radar transmission pulse shape**, *IEE Proc.-Radar, Sonar Navig.*, special issue on modeling and simulation, June 2001.
7. J.R. Guerci, J.S. Goldstein and I.S. Reed, **Optimal and adaptive reduced-rank STAP**, invited paper, *IEEE Transactions on Aerospace and Electronic Systems*, special section on space-time adaptive processing, Vol. 36, No. 2, pp. 647-663, April 2000.
8. C.D. Peckham, A.M. Haimovich, T.F. Ayoub, J.S. Goldstein and I.S. Reed, **Reduced-rank STAP performance analysis**, *IEEE Transactions on Aerospace and Electronic Systems*, special section on space-time adaptive processing, Vol. 36, No. 2, pp. 664-676, April 2000.
9. I.S. Reed, J.S. Goldstein, X. Yu and P. Singer, **A multidisciplinary perspective on adaptive sensor array processing**, invited paper, *IEE Proc.-Radar, Sonar Navig.*, Vol. 146, No. 5, pp. 221-234, October 1999.
10. J.S. Goldstein, I.S. Reed and P.A. Zulch, **Multistage partially adaptive STAP detection algorithm**, *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 35, No. 2, pp. 645-662, April 1999.

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11. J.S. Goldstein, I.S. Reed and L.L. Scharf, **A multistage representation of the Wiener filter based on orthogonal projections**, *IEEE Transactions on Information Theory*, Vol. 44, No. 7, pp. 2943-2959, November 1998.
12. J.S. Goldstein and I.S. Reed, **Theory of partially adaptive radar**, *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 33, No. 4, pp. 1309-1325, October 1997.
13. J.S. Goldstein and I.S. Reed, **Subspace selection for partially adaptive sensor array processing**, *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 33, No. 2, pp. 539-544, April 1997.
14. J.S. Goldstein and I.S. Reed, **Reduced-rank adaptive filtering**, *IEEE Transactions on Signal Processing*, Vol. 45, No. 2, pp. 492-496, February 1997.
15. J.S. Goldstein and I.S. Reed, **Performance measures for optimal constrained beamformers**, *IEEE Transactions on Antennas and Propagation*, Vol. 45, No. 1, pp. 11-14, January 1997.

Conference Papers, Tutorials and Technical Reports:

1. J.S. Goldstein and I.S. Reed, **Space-time adaptive processing II – Advanced STAP**, a tutorial presented at the *IEEE Radar Conference*, Long Beach, CA, April 2002.
2. D.C. Ricks, P. Cifuentes and J.S. Goldstein, **Adaptive beamforming using the multistage Wiener filter with a soft stop**, *Proceedings of the 35th Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2001.
3. S. Sud, W. Myrick, P. Cifuentes and J.S. Goldstein, **A low-complexity MMSE multiuser detector for DS-CDMA**, *Proceedings of the 35th Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2001.
4. S. Sud, W. Myrick, J.S. Goldstein and M.D. Zoltowski, **Performance Analysis of Reduced-Rank MMSE MUD for DS-CDMA**, *Proceedings of IEEE GLOBECOM*, San Antonio, TX, November 2001.
5. S. Sud, W. Myrick, J.S. Goldstein and M.D. Zoltowski, **A reduced rank MMSE receiver for a DS-CDMA system in frequency selective multipath**, *Proceedings of IEEE MILCOM*, McLean, VA, October 2001.
6. W. Myrick, S. Sud, J.S. Goldstein and M.D. Zoltowski, **MMSE correlator-based RAKE receiver for DS-CDMA**, *Proceedings of IEEE MILCOM*, McLean, VA, October 2001.
7. M.D. Zoltowski, M. Johan, J.S. Goldstein and M. Honig, **A new backward recursion for the multistage nested Wiener filter employing Krylov subspace methods**, *Proceedings of IEEE MILCOM*, McLean, VA, October 2001.
8. D.A. Garren, M.K. Osborn, A.C. Odom, J.S. Goldstein, S.U. Pillai and J.R. Guerci, **Optimal transmission pulse shapes for detection and identification with uncertain target aspect**, *Proceedings of the IEEE Radar Conference*, Atlanta, GA, May 2001.
9. J.S. Goldstein and M.D. Zoltowski, **Reduced rank adaptive filtering and applications**, a tutorial presented at the *IEEE International Conference on Acoustics, Speech and Signal Processing*, Salt Lake City, UT, April 2001.
10. S. Chowdhury, M.D. Zoltowski and J.S. Goldstein, **Structured MMSE equalization for synchronous CDMA with sparse multipath channels**, *Proceedings of the IEEE*

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International Conference on Acoustics, Speech and Signal Processing, Salt Lake City, UT, April 2001.

11. W. Myrick, M.D. Zoltowski and J.S. Goldstein, **Low complexity anti-jam space-time processing for GPS**, *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing*, Salt Lake City, UT, April 2001.
12. D.A. Garren, M.K. Osborn, A.C. Odom, J.S. Goldstein, S.U. Pillai and J.R. Guerci, **Optimized target detection and identification using full-polarization radar waveforms**, *Proceedings of the DARPA Adaptive Sensor Array Processing Workshop*, Boston, MA, March 2001.
13. H.E. Witzgall, A. Tarr, J.S. Goldstein, M.D. Zoltowski, and I.S. Reed, **ROCKET: A reduced order correlation kernel estimation technique**, invited paper, *Proceedings of the 34th Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, October 2000.
14. D.C. Ricks, P.G. Cifuentes and J.S. Goldstein, **What is optimal processing for nonstationary data?**, invited paper, *Proceedings of the 34th Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, October 2000.
15. S. Chowdhury, M.D. Zoltowski and J.S. Goldstein, **Reduced-rank adaptive MMSE equalization for high-speed CDMA forward link with sparse multipath channels**, invited paper, *Proceedings of the 34th Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, October 2000.
16. D.A. Garren, M.K. Osborn, A.C. Odom, J.S. Goldstein, S.U. Pillai and J.R. Guerci, **Optimization of single transmit pulse shapes to maximize detection and identification of ground mobile targets**, *Proceedings of the 34th Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, October 2000.
17. P. Thanyasrisung, I.S. Reed, X. Yu, J.S. Goldstein and P.A. Zulch, **Reduced-rank automatic target detection and recognition**, *Proceedings of the 34th Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, October 2000.
18. H.E. Witzgall, J.S. Goldstein and M.D. Zoltowski, **A non-unitary extension to spectral estimation**, *Proceedings of the IEEE DSP Workshop*, Hunt, TX, October 2000.
19. D.C. Ricks and J.S. Goldstein, **Efficient architectures for implementing adaptive algorithms**, invited paper, *Proceedings of the Antenna Applications Symposium*, Monticello, IL, September 2000.
20. W. Myrick, M.D. Zoltowski and J.S. Goldstein, **Adaptive anti-jam reduced-rank space-time preprocessor algorithms for GPS**, *Proceedings of the Institute of Navigation's GPS 2000 Meeting*, Salt Lake City, UT, September 2000.
21. W. Myrick, M.D. Zoltowski and J.S. Goldstein, **Low-sample performance of reduced rank power minimization based jammer suppression for GPS**, *Proceedings of the 6th International Symposium on Spread Spectrum Techniques and Applications*, Parsippany, NJ, September 2000.
22. W. Myrick, M.D. Zoltowski and J.S. Goldstein, **GPS jammer suppression with low-sample support using reduced rank power minimization**, *Proceedings of the 10th IEEE Workshop on Statistical Signal and Array Processing*, Pocono Manor, PA, August 2000.

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23. S. Chowdhury, M.D. Zoltowski and J.S. Goldstein, **Reduced-rank adaptive MMSE equalization for the forward link in high-speed CDMA**, invited paper, *Proceedings of the Midwest Symposium on Circuits and Systems*, East Lansing, MI, August 2000.
24. W. Myrick, M.D. Zoltowski and J.S. Goldstein, **Exploiting conjugate symmetry in power minimization based pre-processing for GPS: reduced complexity and smoothness**, *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing*, Istanbul, Turkey, June 2000.
25. J.S. Goldstein, J.R. Guerci and I.S. Reed, **Advanced concepts in STAP**, invited paper, *Proceedings of the IEEE International Radar Conference*, pp. 699-704, Alexandria, VA, May 2000.
26. J.R. Guerci, J.S. Goldstein and I.S. Reed, **STAP II – Applications and real world considerations**, a tutorial presented at the *IEEE International Radar Conference*, Alexandria, VA, May 2000.
27. W. Myrick, M.D. Zoltowski and J.S. Goldstein, **Anti-jam space-time preprocessor for GPS based on the multistage nested Wiener filter**, *Proceedings of IEEE MILCOM*, Atlantic City, NJ, October 1999.
28. W. Myrick, M.D. Zoltowski and J.S. Goldstein, **Interference suppression for CDMA via a space-time power minimization based processor with application to GPS**, *Proceedings of 37th Allerton Conference on Communications, Systems and Computing*, Monticello, IL, September 1999.
29. W. Myrick, M.D. Zoltowski and J.S. Goldstein, **Smoothing of space-time power minimization based preprocessor for GPS**, *Proceedings of the 2nd AFOSR/DSTO Workshop on Defence Applications of Signal Processing*, Starved Rock State Park, IL, August 1999.
30. J.S. Goldstein, J.R. Guerci, S. Huang and I.S. Reed, **Colored noise matched filtering with unknown covariance**, *Proceedings of the 2nd AFOSR/DSTO Workshop on Defence Applications of Signal Processing*, Starved Rock State Park, IL, August 1999.
31. J.R. Guerci, J.S. Goldstein, P.A. Zulch and I.S. Reed, **Optimal reduced-rank 3D STAP for joint hot and cold clutter mitigation**, *Proceedings of the IEEE Radar Conference*, Boston, MA, April 1999.
32. J.S. Goldstein, J.R. Guerci and I.S. Reed, **An optimal generalized theory of signal representation**, *Proceedings of the IEEE International Conference on Acoustics, Speech and Signal Processing*, Phoenix, AZ, March 1999.
33. J.R. Guerci, J.S. Goldstein, I.S. Reed, H. Nguyen, P.M. Techau and J.S. Bergin, **Optimal reduced-rank STAP for circular arrays**, *Proceedings of the ONR Workshop on Space-Time Adaptive Processing Methods for Circular Ring Arrays with Application to Navy Airborne Surveillance Radar*, George Mason University, Fairfax, VA, February 1999.
34. J.S. Goldstein, I.S. Reed, D.E. Dudgeon and J.R. Guerci, **A multistage matrix Wiener filter for subspace detection**, invited paper, *Proceedings of the IEEE Information Theory Workshop on Detection, Estimation, Classification and Imaging*, Sante Fe, NM, February 1999.
35. L.L. Scharf, J.S. Goldstein and I.S. Reed, **A general framework for deriving reduced rank Wiener filters**, invited paper, *Proceedings of the IEEE Information Theory Workshop on Detection, Estimation, Classification and Imaging*, Sante Fe, NM, February 1999.

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36. R.T. Lacoss, R.K. Brienzo, J.S. Goldstein, R.W. Haupt, S. Kaushik, S.R. Kolek, C.J. Kurys and D. Reiter, **Seismo-acoustic characterization of underground facilities, Lincoln Laboratory summer study final report**, *MIT LL Project Report UGF-1*, December 1998.
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