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Abstract: [IEICE study groups on Reliable Robust Radio Control has been promoting research and development on dependable wireless systems for wide variety of life critical applications such as medicine, disaster, dependable sensing and controlling cars, buildings, smart grids, and smart city by extending BAN from human body to bodies of cars, buildings, and so on. While keeping advantages of IEEE802.15.6, specifications of MAC and PHY may be revised to make it much more reliable, secure, fault tolerant, robust against undesired factors. This slides may offer opportunity to discuss on use cases and applications of this standard.]
Purpose: [The discussion on use cases and applications will lead definition and requirement of current ongoing research and development on dependable wireless networks.]

Overview of Japanese IEICE SG on Reliable Radio Remote Control(RRRC)

17th March, 2014 Beijing

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Agenda

1. Introduction of IEICE SG on Reliable Radio Remote Control(RRRC)
2. IEICE Transactions on Fundamentals, Special Issues on RRRC

1. Introduction of IEICE SG on Reliable Radio Remote Control(RRRC)

Kouichi Kobayashi(JAIST)
Ryuji Kohno(YNU, CWC-Nippon)

1.1 History of IEICE SG-RRRC

- History
  - May 2010: RRRC was established.
  - July 2010: The first workshop was held.
  - April 2012: The active period was extended to March 2014.
  - April 2014: RRRC will be renewed as RCC (Reliable Communication and Control).
- Chairs
  - 2010/5-2012/3 Ryuji Kohno (Yokohama National University)
  - 2012/4- Masaaki Katayama (Nagoya University)
- Special Sections in IEICE Trans. on Fundamentals
  - April 2012: Reliable Robust Radio Control Technology (6 papers)
  - May 2013: Networked Control Systems: Theories & Applications (10 papers)

1.2 2010 FY Workshops of IEICE SG-RRRC

1st Workshop (2010/7/28): 7 oral presentations

2nd Workshop (2010/11/1): 10 oral presentations

3rd Workshop (2011/1/11): 7 oral presentations

2011 FY 1st Workshop（2011/6/17）

[Invited] Development of wireless communication system in narrow and complicated space, N. Kikuchi et al. (Oki)

A study on Polling-based protocol for wireless feedback system to control inverted pendulums, R. Takahashi et al. (Yokohama National Univ.)

Influence of reduction of transmitted information on the control quality in wireless feedback controlled system, R. Mizutani et al. (Nagoya Univ.)

Influence of cyclostationary noise on the behavior of a powerline-controlled rotary inverted pendulum, C. Carrizo et al. (Nagoya Univ.)

A study on H-ARQ error-controlling scheme for wireless feedback system has an unstable pole, T. Futatsugi et al. (Yokohama National Univ.)

[Invited] Distributed optimization and game for visual feedback, T. Hatanaka and M. Fujita (Tokyo Tech)

A study on reliable robust wireless control by diversity gain for cooperated operation of multiple machines, Y. Watanabe et al. (Yokohama National Univ.)

A study on UWB packet design to realize position estimation with information-communication for mobile robo, R. Iwakura et al. (Yokohama National Univ.)

What is the advantage of wireless in control, T. Fujiwara and S. Hara (Osaka City Univ.)

2011 FY 2nd Workshop（2011/11/1）

[Invited] Reliable Wireless Bits to a Jammed Receiver through Protocol Coding: Concept and Experimental Validation, Petar Popovski（Aalborg Univ.）

A study on the influence of packet loss on wireless feedback control systems with a state observer, K. Kobayashi et al. (Nagoya Univ.)

Proposal of MAC protocol for ZCZ-CDMA system, D. Tanaka et al. (Yamaguchi Univ.)

Study on distributed power control network to suppress the peak power consumption, Ky Nguyen Van et al. (Tokyo Tech)

[Tutorial] Study on reliability improvement with spatially multiplexed OFDM signals, Y. Sanada (Keio Univ.)

Self-Triggered optimal control for networked control systems, K. Kobayashi and K. Hiraishi (JAIST)

How Can We Improve the Reliability of Wireless? - Distant Multipath Routing -, S. Hara (Osaka City Univ.)

2011 FY 3rd Workshop（2012/1/27）

[Invited] Wireless Communications for industrial field usage, S. Shimada (Yokogawa Electric Co.)

Cyclic codes processor for various generator polynomials, K. Ohya et al. (Osaka Univ.)

The method of reduction of transmitted information with considering the paclet loss in wireless feedback controlled systems, R. Mizutani et al. (Nagoya Univ.)

Controller design based on information connection for multilateral teleoperation systems, R. Kubo (Keio Univ.)

Stabilization of networked control systems based on prediction, M. Nagahara (Kyoto Univ.)

Data rate limitations for stabilization of uncertain systems, K. Okano and H. Ishii (Tokyo Tech)

Building robust network system for building automation, K. Hirose (Shimizu Corporation)

[Invited] Quantized control, S. Azuma (Kyoto Univ.)

2012 FY 1st Workshop (2012/6/5-6)

Sensor-MIMO for industrial field usage and challenges, S. Shimada (Schubiquist Technologies Guild)

Forward error correction based on packet loss detection and state estimation for wireless feedback control, S. Hattori et al. (Nagoya Univ.)

Comparative study of compressed-sensing methods for remote control, M. Nagahara (Kyoto Univ.)

How can we improve the reliability of wireless, S. Hara and M. Kubo (Osaka City Univ.)

[Special Lecture] Global development vision of dependable wireless technologies in academic and industrial fields, Ryuji Kohno (Yokohama National Univ.)

[Special Lecture] Communications for Reliable Robust Controls, M. Katayama (Nagoya Univ.)

A study on adaptive wireless power provision scheme via sheet medium for multiple robots, Y. Kado et al. (NICT)

Development of wireless power and data transmission system via sheer medium for robot, B. Zhang et al. (NICT)

A study on optimal renewable energy management via game theoretic learning algorithm, T. Hatanaka and M. Fujita (Tokyo Tech)

[Invited] Disaster-tolerant dependable wireless network, R. Miura (NICT) et al.

2012 FY 2nd Workshop（2012/10/17-19）

[Invited] Academic and industrial impacts of reliable robust control communication, M. Katayama (Nagoya Univ.)

Clock synchronization in wireless sensor networks, Y. Kadowaki and H. Ishii (Tokyo Tech)

Distributed power control network utilizing home-gateway, Van Ky Nguyen (Tokyo Tech) et al.

End-to-End latency reduction of multi-hop wireless LAN, M. Miyashita (Central Research Institute of Electric Power Industry) and J. Takada (Tokyo Tech)

A study on TDMA/CDMA hybrid protocol for inverted pendulum control, R. Takahashi et al. (Yokohama National Univ.)

A study on reliable robust wireless control by diversity gain for cooperated operation of multiple machones, Y. Watanabe et al. (Yokohama National Univ.)

A study on reliable radio-based control system, T. Goto and T. Ikegami (Meiji Univ.)

A note on the reduction of transmitted information using a predicted control information in wireless control of multiple plants, R. Mizutani et al. (Nagoya Univ.)

2012 FY 3rd Workshop（2013/1/11）

Time frequency offset measurement and calibration procedure for WLAN sensor application, S. Shimada (Schubiquist Technologies Guild.)

The long-distance PTP clock synchronization through Wideband InterNetworking Satellite WINDS, T. Shimizu (Yokohama National Univ.) et al.

Performance evaluation of adaptive coding for wireless feedback controls in fading channels, S. Hattori et al. (Nagoya Univ.)

Coarsest quantization for networked control systems with plant uncertainties, Xile Kang and Hideaki Ishii (Tokyo Tech)

Performance evaluation of a low-delay high reliability OFDM system, H. Okui et al, (The Univ. of Tokyo)

［Invited］ Reliability of communications in medical information systems, H. Kondoh (Tottori Univ.)

2013 FY 1st Workshop (2013/5/16-17)

Wireless packet collision detection using self-interference canceller, W. Kawata et al. (Kyoto Univ.)

A study on the reduction of synchronization error using a relay of predictive control information in wireless control of multiple plants, A. Tanaka et al. (Nagoya Univ.)

A consideration on fault tolerance and power saving of cooperative diversity scheme for reliable wireless communication, Y. Saito and T. Ikegami (Meiji Univ.)

A study on performance of data collection and command broadcasting using multi-hop wireless network, I. Yamashita and T. Maeda (Kansai Electric Power)

［Invited］ An outline of process control, M. Kano (Kyoto Univ.)

［Invited］ Energy saving technology based on causality between quality measure and energy consumption, M. Ida (OMRON)

［Invited］ Quantum filtering theory and its application to optical phase tracking, K. Ohki (Kyoto Univ.)

A study on M2M2H communications exploiting a secondary channel of wireless LAN, S. Kakibuchi (Kansai Univ.) et al.

On sparsity of L1-optimal control, M. Nagahara (Kyoto Univ.)

Effect of inter-base station clock synchronization error on location estimation in celluar systems, S. Hara (Osaka City Univ.)

2013 FY 2nd Workshop（2013/7/17-19）

A wireless multihop scheduling scheme for networked control systems, S. Ochi et al. (Osaka Univ.)

A study on node position estimation of wireless sensor network for equipment maintenance, M. Miyashita et al. (Central Research Institute of Electric Power Industry)

Wireless mesh network for resilient telecommunications in disaster, R. Miura et al. (NICT)

［Invited］ Distributed optimization of networked systems via generalized primal-dual algorithm, K. Tsumura (The Univ. of Tokyo)

6 poster presentations

Kouichi Kobayashi(JAIST)
Ryuji Kohno(YNU, CWC, CWC-Nippon)

2013 FY 3rd Workshop（2013/11/21-22）

Optimal control of multi-hop control networks based on mixed logical dynamical systems, K. Kobayashi and K. Hiraishi (JAIST)

Sparse control for energy conservation, M. Nagahara (Kyoto Univ.)

［Invited］ Optimization of the communication layer based on information of the control layer for wireless feedback control systems, K. Kobayashi (Nagoya Univ.)

［Invited］ Propagation characteristics for implant BANs and their application for location estimation, D. Anzai (Nagoya Inst. of Tech.)

Adaptive coding scheme based on prediction of tracking error in wireless feedback control systems, S. Hattori et al. (Nagoya Univ.)

Location based CCA with direct link for networked control communication, S, Shimada (Schubiquist Technologies Guild.)

2013 FY 4th Workshop（2014/1/31）

Timing synchronization performance of short preamble sequence with orthogonal frequency multiplexed data symbols, Y. Tanaka and Y. Sanada (Keio Univ.)

Experimental evaluations of microwave propagation properties in a closed space to establish a wireless harness technology, N. Kukutsu et al. (ATR)

Distributed network forming among devices of proximities, H.-B. Li and R. Miura (NICT)

Optimum link scheduling for wireless networked control systems, S. Ochi et al. (Osaka Univ.)

Reliability and latency evaluation of cooperative transmission system against the effects of communication quality by the moving obstacle, Y. Saito and T. Ikegami (Meiji Univ.)

Pulse duty factor evaluation of indoor direct sequence spread spectrum reliable radio communications, M. Sakata and T. Ikegami (Meiji Univ.)

2. IEICE Transactions on Fundamenals

2.1 Special Section on Reliable Robust Radio Control Technology

IEICE TRANSACTIONS on Fundamentals, Volume E95-A No.4

pp.679-679 FOREWORD, Ryuji KOHNO

pp.680-690 Data Rate Limitations in Feedback Control over Networks, Hideaki ISHII, Koji TSUMURA

pp.691-696 Optimization-Based Synthesis of Self-Triggered Controllers for Networked Systems, Koichi KOBAYASHI, Kunihiko HIRAISHI

pp.697-705 A Wireless Control System with Mutual Use of Control Signals for Cooperative Machines, Tsugunori KONDO, Kentaro KOBAYASHI, Masaaki KATAYAMA

pp.706-712 Control Quality of a Feedback Control System under Cyclostationary Noise in Power Line Communication, Cesar CARRIZO, Kentaro KOBAYASHI, Hiraku OKADA, Masaaki KATAYAMA

pp.713-722 Compressive Sampling for Remote Control Systems, Masaaki NAGAHARA, Takahiro MATSUDA, Kazunori HAYASHI

pp.723-734 A Distant Multipath Routing Method for Reliable Wireless Multi-Hop Data Transmission, Kento TERAI, Daisuke ANZAI, Kyesan LEE, Kentaro YANAGIHARA, Shinsuke HARA

2.2 Special Section on Networked Control Systems: Theories & Applications

IEICE TRANSACTIONS on Fundamentals, Volume E96-A No.5

pp.843-843 FOREWORD, Masaaki KATAYAMA

pp.844-852 Demands on Reliable and Robust Wireless Communications under Land-Sea-and-Air Extreme Environments, Kazuya YOSHIDA, Koji IZUMI, Hiroshi YOSHIDA, Ryu MIURA, Fumie ONO

pp.853-860 Networked Control of Uncertain Systems over Data Rate Limited and Lossy Channels, Kunihisa OKANO, Hideaki ISHII

pp.861-868 Self-Triggered Model Predictive Control with Delay Compensation for Networked Control Systems, Koichi KOBAYASHI, Kunihiko HIRAISHI

pp.869-877 Impact of the Reduction of Transmitted Information on the Control Quality in a Wireless Feedback Control System, Ryota MIZUTANI, Kentaro KOBAYASHI, Hiraku OKADA, Masaaki KATAYAMA

pp.878-885 Co-scheduling of Communication and Control of Multi-Hop Control Networks, Yasuki NANAMORI, Toshimitsu USHIO

pp.886-895 Secure and Efficient Report Protocol for Networked Smart Grid Systems Using Linear Map, Youngsam KIM, Joon HEO

pp.896-907 Distributed Power Control Network and Green Building Test-Bed for Demand Response in Smart Grid, Kei SAKAGUCHI, Van Ky NGUYEN, Yu TAO, Gia Khanh TRAN, Kiyomichi ARAKI

pp.908-915 An Independent Sleep Scheduling Protocol for Increasing Energy-Efficiency in Wireless Body Area Networks, Seungku KIM, Huan-Bang LI, Doo-Seop EOM

pp.916-926 Decentralized Equal-Sized Clustering in Sensor Networks, Takeshi KUBO, Atsushi TAGAMI, Teruyuki HASEGAWA, Toru HASEGAWA

pp.927-934 Experimental Evaluation of Ultra Wideband Wireless Links within a Spacecraft for Replacing Wired Interface Buses, Shinichiro HAMADA, Atsushi TOMIKI, Tomoaki TODA, Takehiko KOBAYASHI

IEICE SG on on Reliable Robust Radio Control will be a Regular Study Group since May, 2014

URL of
IEICE SG on Reliable Robust Radio Control
http://www.ieice.org/~rcc/