Rajib Paul

Computer Science & Engineering • Doctor of Philosophy
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EDUCATION

Ajou University, Suwon, South Korea

- Ph.D. in Computer Science & Engineering — Sep 2012 – Feb 2017
  - Dissertation: Enhanced Adaptive Rendezvous with Interface Selection in CRNs.
  - Adviser: Prof. Young June Choi
  - Focus: Wireless communications, cognitive radio networks, rendezvous, MAC.
- Masters in Computer Science & Engineering — Sep 2010 – Aug 2012
  - Dissertation: A Two-Step Two-Bit Softened Detection in CRNs
  - Adviser: Prof. Young June Choi
  - Focus: Wireless communications, cognitive radio networks, energy detection, false detection.

West Bengal University of Technology, West Bengal, India.

- B.TECH in Electronics & Communications Engineering — Jul 2005 – Jun 2009

PROFESSIONAL EMPLOYMENT

Postdoctoral Scholar, Korea University

- Department of Computer Science & Engineering — Nov 2024 – Present

Postdoctoral Scholar, Hanyang University

- Department of Electrical & Electronics Engineering — Aug 2024 – Sep 2024

Standardization Engineer, Wilus Inc.

- IEEE Team — Jan 2024 – Apr 2024

Assistant Professor, Ajou University

- Department of Software Engineering — Mar 2018 – Dec 2023

Research Scholar, Ajou University

- Department of Information and Communication Technology — Mar 2017 – Feb 2018

Teaching Assistant, Ajou University

- Department of Information and Communication Technology — Sep 2013 – Jun 2017
  - Focus: Digital Circuits, Computer Networks, Advanced Data Mining, Radio Resource Management, Mobile Communications and Networks

RESEARCH EXPERIENCE

Standardization Engineer, Wilus Inc

- IEEE Team — Jan 2024 – Apr 2024
  - Pre-standardization research on 802.11bn, while analyzing specifications for 802.11ax and 802.11be.
  - Proactively monitoring the status and trends of Wi-Fi standardization.
  - Engaging in the patent development process, contributing expertise and insights to ensure industry standards.

Assistant Professor, Ajou University

- Department of Software Engineering — Mar 2018 – Dec 2023
  - Developed course lesson plans and materials that complied with required educational standards and increased exam average scores by 10%. Administered course exams and evaluated performance to measure student progress.
  - Supervised student projects requiring the design, implementation, and maintenance of software applications.
  - Machine learning-based network architecture design for latency-guaranteed networking in cellular networks.
  - System and protocol design for data dissemination in large-scale device-to-device (D2D) networks
  - Collaborated with cross-disciplinary teams to advance wireless technologies, leading to multiple publications.
  - 6G use cases study for ultra-low latency scenarios.
  - Engaged actively in university service activities, including interviewing and orienting new international students, serving on hiring committees, and organizing discussion events for international faculty.

PhD Research Assistant, Ajou University

- Department of Information & Communications Engineering — Sep 2012 – Dec 2017
- Project: Rendezvous in cognitive radio networks.
  - Designing channel hopping sequences (CHS) for rendezvous in SoNs.
  - Developing MAC protocol and verifying its correctness through analysis and simulations.
- Project: Radio interface selection/Network Selection
  - Formulating a game-theoretic approach for radio interface selection for node.
  - Developing an efficient algorithm for non-cooperative games Nash equilibrium
- Project: Channel Assignment for MANET
  - Designing efficient algorithm for channel assignment and jammer mitigation.

Masters Research Assistant, Ajou University

- Department of Information & Communications Engineering — Sep 2010 – Jun 2012
- Project: Spectrum Sensing in cognitive radio networks(CRNs).
  - Cooperative energy detection technique to reduce false detection in cognitive radio networks.

AWARDS & SCHOLARSHIPS

- Excellence in Education Award, Ajou University — 2020
- Global IT Scholarship during Masters Program Ajou University — 2010 – 2012
- Graduate scholarship "A" as a top-performing student, Ajou University — 2010 – 2012
- Brain Korea (BK-21) Scholarship during PhD Program. — 2012 – 2016
- DySPAN Travel Grant, Mclean, VA U.S.A — 2014

PUBLICATIONS

JOURNALS

[11] Y. Deng, R. Paul, and Y.J. Choi, "Multiple QoS Enabled Intelligent Resource Management in Vehicle-to-Vehicle Communication," *IEEE Transactions on Intelligent Transportation Systems*, vol.25, no. 9, pp. 12081-12094, Sep 2024.

[10] R. Paul, J. Jang, Y.J. Choi, "Channel-Hopping Sequence and Rendezvous MAC for Cognitive Radio Networks," *Sensors*, vol. 22, no. 16, pp. 5949–5959, Aug 2022.

[9] Y.Z. Jembre, W. Jung, M. Attique, R. Paul, B. Kim, "Mobile broadband performance evaluation: analysis of national reports," *Electronics*, vol. 11, no. 3, pp. 485–495, Aug 2022.

[8] J. Ko, Y.J. Choi, and R. Paul, "Computation offloading technique for energy efficiency of smart devices," *Journal of Cloud Computing*, vol. 10, no. 1, pp. 1–15, Dec 2021.

[7] Y.Z. Jembre, Y.W. Nugroho, M.T.R. Khan, M. Attique, R. Paul, S. Hassan A. Shah, B. Kim, "Evaluation of Reinforcement and Deep Learning Algorithms in Controlling Unmanned Aerial Vehicles," *Applied Sciences* , vol. 11, no. 16, pp. 7240–7250, Aug 2021.

[6] J.Y. Song, R. Paul, J.H. Yun, H.C. Kim, Y.J. Choi, "CNN-based anomaly detection for packet payloads of industrial control system," *International Journal of Sensor Networks*, vol. 36, no. 1, pp. 136–49, May 2021.

[5] R. Paul, and Y.J. Choi, "Autonomous interface selection for multi-radio D2D communication," *IEEE Access*, vol. 7, no., pp. 108090-108100, Aug 2019.

[4] R. Paul, Y.J. Choi, J. Jang, Y.S. Kim, "Channel Hopping Using p-ary m-Sequence for Rendezvous in Cognitive Radio Networks," *IEEE Wireless Communications Letters*, vol. 8, no. 6, pp. 1516–1519, Jun 2019.

[3] R. Paul, Y.J. Choi, "Adaptive rendezvous for heterogeneous channel environments in cognitive radio networks," *IEEE Transactions on Wireless Communications* , vol. 15, no. 11, pp. 7753-7765, Sep 2016.

[2] R. Paul, J. Jang, Y.J. Choi, "Selectively triggered cooperative sensing in cognitive radio networks," *IET Communications*, vol. 8, no. 15, pp. 2720-2728, Oct 2014.

[1] Y.Z. Jembre, Y.J. Choi, R. Paul, W. Pak, Z. Li, "Informed spectrum discovery in cognitive radio networks using proactive out-of-band sensing," *KSII Transactions on Internet and Information Systems (TIIS)*, vol. 8, no. 7, pp. 2212-2230, May 2014.

CONFERENCES

[7] J. Chen, R. Paul, Y.J. Choi, "An Efficient Neural Network-Based Next-Hop Selection Strategy for Multi-Hop VANE," in *International Conference on Information Networking (ICOIN)*, Jan 2021.

[6] T. Shw, R. Paul, and Y. J. Choi, "Enhance Classification Accuracy of Wireless Interference Identification by using Transfer Learning," in *The Korean Institute of Communications and Information Sciences (KICS) Conference*, Aug 2020.

[5] R.A. Rukman, Y.J. Choi, R. Paul, "Application of Heuristic-Learning Model to Reduce Spectrum Sensing Energy in CRNs," in *International Conference on Information and Communication Technology Convergence (ICTC)*, Oct 2019.

[4] J.W. Jang, Y.J. Choi, R. Paul, Y.S. Kim, "New channel hopping sequence for cognitive radio systems using p-ary m-sequence," in *International Conference on Ubiquitous and Future Networks (ICUFN)*, Jul 2016.

[3] R. Paul, and Y.J. Choi, "Multi-interface rendezvous in self-organizing cognitive radio networks," in *International Symposium on Dynamic Spectrum Access Networks (DYSPAN)*, Apr 2014.

[2] Y.Z. Jembre, R. Paul, Y.J. Choi, K. Cheon, C.J. Kim, "Channel assignment and jammer mitigation for military MANETs with multiple interfaces and multiple channels," in *International Conference on Ubiquitous Information Management and Communication*, Jan 2014.

[1] R. Paul, and Y.J. Choi, "Two-step softened decision for cooperative spectrum sensing in cognitive radio networks," in *International Conference on Ubiquitous and Future Networks (ICUFN)*, Jan 2012.

SKILLS

- **Programming Language**: Python, C++, C, Java, MATLAB
- **Software**: Linux, Tensorflow, Pytorch, Docker, Git, GitHub, CI/CD
- **Machine Learning**: Scikit-learn, Pandas, NumPy, Matplotlib, Jupyter Notebook, XGBoost
- **Expertise**: 3GPP, 5G, Wireless Communications, ML, 802.11ax/be, Computer Networking
- **Soft Skills**: Time Management, Problem-solving, Documentation, Engaging Presentation, Leadership

PROJECTS & GRANTS

- S-2020-A0316-00001 Evaluation and Establishment of Digital Healthcare System(Co-Investigator)
  - Funding Organization: KTI, South Korea 2019 – 2023
- Fresh faculty research grant
  - Funding Organization: Ajou University, South Korea. 2019 – 2022
- Quality-Guaranteed data delivery and reconstruction based on compressive sensing for WSN.
  - Funding: Joint research project Natural National Science Foundation of China (NSFC) and National Research Foundation (NRF) of South Korea 2015 – 2017
- Efficient Radio Resource Management in Multi-Channel Multi-Radio Dynamic Spectrum Access (DSA) Based Mobile Ad-Hoc Networks (MANETs)
  - Funding: Electronics and Telecommunications Research Institute (ETRI) 2012 – 2013
- Efficient Radio channel management in MCMR self-organizing distributed network environment.
  - Funding: Electronics and Telecommunications Research Institute (ETRI) 2013 – 2014
- Research on Cognitive Radio and Mobile Ad Hoc Networks (CRN and MANET).
  - Funding: Brain Korea 21, Ministry of Information and Communications 2010 – 2016

TEACHING EXPERIENCE

Assistant Professor, Ajou University

Undergraduate Courses 2018 – 2023

- Digital Circuits and Practice, Computer Networks, Data Structure and Practice, Object-oriented Programming (Java), Computer Organization and Architecture

Graduate Courses

- Machine Learning in Wireless Communications, Radio resource management

Teaching Assistant, Ajou University

Assisted Courses 2012 – 2017

- Capstone Design Project(CSE 401), Radio Resource Managements

LANGUAGES

English

● Listening: C2 ● Reading: C2 ● Spoken Instruction: C1 ● Spoken Production: C1 ● Writing: C1

Bengali

● Listening: C2 ● Reading: C2 ● Spoken Instruction: C2 ● Spoken Production: C2 ● Writing: C1

ACADEMIC SERVICES

Guest Editor,

- Sensors Special Issue 2019
  - Selected papers from ICTC.
- Sensors Special Issue 2021
  - Selected Papers from ICOIN.

International Journal Co-Chair

- ICOIN 2021

Poster Chair

- ICOIN 2021

Review Works

- IEEE Access, Sensors, IEEE DySPAN, IEEE Transactions on Cognitive Communications and Networking, IEEE Transactions on Communications, IEEE/ACM Transactions on Networking, IEEE Wireless Communications Magazine, IEEE Transactions on Wireless Communications, Transactions on Emerging Telecommunications

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