Rajib Paul

Computer Science & Engineering · Doctor of Philosophy

206, Worldcup-ro, Yeontong-gu, Suwon, 16499, Rep. of KOREA

(+82) 10-3184-5359 | rajib@ajou.ac.kr

Education

PhD in Computer Science and Engineering — *Suwon, South Korea.*

Ajou University — *Sep. 2012 - Feb. 2017*

- **Thesis:** Enhanced Adaptive Rendezvous with Interface Selection in Cognitive Radio Networks.
- *Supervisor:* Prof. Young-June Choi
- *ECA Number*: 4793137IMM

Masters in Computer Science and Engineering — *Suwon, South Korea.*

Ajou University — *June. 2010 - July. 2012*

- **Thesis:** A Two-Step Two-Bit Softened Detection in Cognitive Radio Networks.
- *Supervisor:* Prof. Young-June Choi

B.Tech in Electronics and Communication Engineering — *West Bengal, India*

Netaji Subhash Chandra Engineering College — *June. 2005 - July. 2009*

- **Thesis:** Frequency Shift Keying (FSK) based Modulation & Demodulation.

Professional Employment

Assistant Professor — *Suwon, S.Korea*

Department of Software and Computer Engineering, Ajou University — *Feb. 2018 - Present*

- Collaborate with faculty members to establish course curricula in accordance with department standard.
- Co-advising multiple graduate student in the Mobile Planets Lab, Ajou University.
- Conduct scientific research to publish in leading journals and conferences.

Research Assistant — *Suwon, South Korea*

Mobile Planets Lab, Ajou University — *September. 2017 - Feb. 2018*

- Actively participate as a member of research team to the production of research reports and publications.
- Reinforcement learning applications in wireless communications.

Researcher(PhD+Masters) — *Suwon, South Korea*

Mobile Planets Lab, Ajou University — *September. 2010 - Dec. 2017*

- Participate in cutting edge research in the area of wireless communication.
- Primarily, Inter-RAT, LTE, Wi-Fi, and vehicular resource management, including device-to-device (D2D) communications.
- Conduct teaching assistance in undergraduate and graduate level coursework.

Research Intern — *Suwon, S.Korea*

WinStarTech Co. Ltd. — *Jan 2011 - Feb. 2011*

- Application to measure distance in Wi-Fi environment.(Longitude and Latitude of unknown point with reference to other know points).

Research Intern — *Seoul, S.Korea*

Jcast Networks Korea, Inc. — *Jul. 2011 - Aug. 2011*

- Video Encode and Decoder over Zigbee (H.264).
- USN based Architecture for Traffic Management.

Research Experience

PhD Research Assistant — *Suwon, S.Korea*

Ajou University — *Sep. 2012 - Feb. 2017*

Rendezvous in Cognitive Radio Networks.

- Solution that guarantees rendezvous in symmetric and asymmetric model with heterogeneous channel condition. Also improve the time to rendezvous (TTR) with a novel channel hopping sequence (CHS).
- Proposed a general MAC for current rendezvous.

Radio interface selection/Network Selection

- Formulate a game theoretic approach for radio interface selection among rendezvoused nodes.
- Efficient algorithm to achieve the Nash Equilibrium for such non-cooperative game.

Channel Assignment on MANET

- Efficient algorithm for channel assignment and jammer mitigation.

Masters Research Assistant *Suwon, S.Korea*

Ajou University *June. 2010 - July. 2012*

Spectrum Sensing in Cognitive Radio Networks.

- Efficient two step algorithm for energy detection and reduce miss detection.

Grant: Co-Investigator

KTI, Korea — **S-2020-A0316-00001** Evaluation and Establishment of Digital Healthcare System — *2019-Present*

Teaching Experience

Course Instructor

Ajou University *Mar. 2018 - Current*

- **Courses:**
  - Digital Circuits and Practice, *Undergraduate*
  - Computer Networks, *Undergraduate*
  - Data Structure and Practice, *Undergraduate*
  - Machine Learning in Wireless Communications, *Graduate*
  - Radio resource management, *Graduate*
- **Responsibility:** Course development, lectures, team project supervision with final demo, hands on lab session, and grading.

Teaching Assistant

Ajou University *Mar. 2018 - Current*

- **Course:**
  - Capstone Design Project(CSE 401)
- **Responsibility:** Prepare lecture materials, assist lab sessions along with technical/scientific writing and poster presentations.

Supervision

Co-supervision

Rinaldy Rukman

Masters Student *Fall 2019*

- **Thesis:** Heuristic-Learning spectrum sensing in cognitive radio networks.
- **Publication:** Application of Heuristic-Learning Model to Reduce Spectrum Sensing Energy inCRNs *International Conference on Information and Communication Technology (ICTC).*

Thida Shew

Masters Student *Spring 2020*

- **Thesis:** Enhanced classification accuracy of wireless interference identification by using Transfer Learning.
- **Publication:** Enhanced classification accuracy of wireless interference identification by using Transfer Learning in *The Korean Institute of Communications and Information Sciences (KICS) Conference.*

Chen Junyao

Masters Student *Fall 2020*

- **Thesis:** Applying neural network on the VANETs routing protocol for next-hop selection.
- **Publication:** An efficient neural network-based next-hop selection strategy for multi-hop VANETs in *The Korean Institute of Communications and Information Sciences (KICS) Conference.*

Pritom Das

Masters Student *Feb.2019 - Present*

Topic: Machine learning multi-RAT multi-user wireless networks.

Publications

In preparation R. PAUL, Y. J. Choi, “Channel-hopping sequence and rendezvous MAC for CRNs”.

Under Review

Journal of Cloud Computing J. Ko, R. PAUL, Y. J. Choi, “Computation Offloading technique for energy efficient smart devices”.

Journal

2021 **International Journal of Sensor Networks** J. Y. Song, R. Paul, J. H. Yun, H. C. Kim, and Y. J. Choi, " CNN-based Anomaly Detection for Packet Payloads of Industrial Control System".(In print)

2019 **IEEE Access** R. Paul and Y. J. Choi,"Autonomous Interface Selection for Multi-Radio D2D Communication", vol. 7, pp. 108090-108100.(Impact Factor:4.098)

2019 **IEEE Wireless Communications Letters** R. Paul, Y.J. Choi, J. Jang, and Y.S. Kim, "Channel Hopping Using p-ary m-sequence for Rendezvous in Cognitive Radio Networks".(Impact Factor: 3.54)

2016 **IEEE Transactions on Wireless Communications** R. Paul, and Y.J. Choi, "Adaptive rendezvous for heterogeneous channel environments in cognitive radio networks", 15(11), pp.7753-7765.(Impact Factor: 6.39)

2014 **IET Communications** R. Paul., W. Pak, and Y.J. Choi, "Selectively triggered cooperative sensing in cognitive radio networks", 8(15), pp.2720-2728.

2014 **TIIS** Y.Z. Jembre, Y.J. Choi, R. Paul, W. Pak, and Z. Li, "Informed Spectrum Discovery in Cognitive Radio Networks using Proactive Out-of-Band Sensing", 8(7), pp.2212-2230.

Conference

2021 **Internation Conference on Information Networking (ICOIN)** Chen Junyao, R. Paul, and Y. J. Choi, "An Efficient Neural Network-Based Next-Hop Selection Strategy for Multi-Hop VANETs." (In Print)

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

2019 **International Conference on Information and Communication Technology (ICTC)** R. A. Rukman, Y.J. Choi, and R. Paul, "Application of Heuristic-Learning Model to Reduce Spectrum Sensing Energy in CRNs", pp. 648-652.

2016 **International Conference on Ubiquitous and Future Networks (ICUFN)** Jang, J.W., Choi, Y.J., R. Paul, and Y.S. Kim, "New channel hopping sequence for cognitive radio systems using p-ary m-sequence", pp. 632-634.

2014 **International Conference on Ubiquitous Information Management and Communications** Y.Z. Jembre, R. Paul, Y.J. Choi, K.Y. Cheon, and C.J. Kim, "Channel assignment and jammer mitigation for military MANETs with multiple interfaces and multiple channels", p. 66.

2014 **IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)** R. Paul, Y.Z. Jembre, and Y.J. Choi, "Multi-interface rendezvous in self-organizing cognitive radio networks", pp. 531-540.

2012 **International Conference on Ubiquitous and Future Networks (ICUFN)** R. Paul, and Y.J. Choi, "Two-step softened decision for cooperative spectrum sensing in cognitive radio networks", pp. 242-246.

Academic Services

- **Guest Editor** of *Sensors Special Issue*: Selected papers from ICTC 2019.
- **International Journal Co-Chair** of *ICOIN, 2021*.
- **Poster Chair** of *ICOIN, 2021*.
- **Review Works:**
  - Sensors
  - IEEE Access
  - IEEE DySPAN
  - IEEE Transactions on Communications
  - IEEE/ACM Transactions on Networking
  - IEEE Wireless Communications Magazine
  - IEEE Transactions on Wireless Communications
  - Transactions on Emerging Telecommunications Technologies

Awards

2020	Excellence in Education Award	*Ajou University*
2010-2012	Global IT Scholarship during Masters Program.	*Suwon S. Korea*
2013-2017	Brain Korea (BK-21) Scholarship during PhD Program.	*Suwon, S. Korea*
2012-2015	Graduate scholarship "A" as a top performing student.	*Suwon, S. Korea*
2014	DySPAN Travel Grant.	*Mclean, VA U.S.A*

Technical Skills

- **Programming Language**: C, C++, MatLab, Python, Java
- OpNET, NS2, Wireshark, OpenStack, Linux Administrtion

References

Prof. Young-June Choi
Department of Software and Computer Engineering
Ajou University
Suwon, South Korea
choiyj@ajou.ac.kr

Prof. Seok-Won Lee
Department of Software and Computer Engineering
Ajou University
Suwon, South Korea
leesw@ajou.ac.kr

Prof. Byeong-Hee Roh
Department of Information and Computer Engineering
Ajou University
Suwon, South Korea
bhroh@ajou.ac.kr

Prof. Kyungran Kang
Department of Information and Computer Engineering
Ajou University
Suwon, South Korea
korykang@ajou.ac.kr