Pulok Tarafder

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Research Interests

Wireless Networks, UAV, Deep Reinforcement Learning, CRAN, RIS, mmWave Massive MIMO

Education

Chosun University, Gwangju, South Korea

- Masters in Computer Engineering, Grade 4.19/4.5 (96.28%) (expected graduation: Dec 2022)
- Advisor: Wooyeol Choi

Brac University, Dhaka, Bangladesh

- Bachelor of Science in Electrical and Electronic Engineering (Apr 2019)
- Grade: 3.07/4.0 (3.53/4 in 300 & 400 level courses)
- Senior thesis: Comprehensive mathematical analysis and simulation design of a microwave wireless power transmission system, highest honors

Research Experience

Graduate Research Assistant at Smart Networking Lab

Dept. of Computer Engineering, Chosun University (Mar 2021 - present)

- Perform research on the channel estimation, applications of deep reinforcement learning and federated learning in mmWave massive MIMO beamforming, and mmWave MAC protocols
- Conference reviewer: ICAIIC 2022

Research Assistant at Control & Applications Research Centre

Dept. of Electrical and Electronic Engineering, Brac University (May 2019 - Feb 2021)

- PSpice Instructor for EEE202 Lab
- Prepared project proposals, project reports, annual reports, reviewed domestic conference papers
- Designed and implemented a torque sensor circuit for the project *Digitalization and Development of Torque Sensor Based Control System of Solar Powered Electric Wheel-chair with a Dedicated Solar Charger Kit*
- Worked on the development and troubleshooting of the project *Double Burner Smart Electric Stove Powered by Solar Photovoltaic Energy*

Skills

- **Software**: Python (TensorFlow, Keras, PyTorch, OpenAI Gym, NumPy), Matlab, LaTeX, Git, Java, Ansys Electronics (HFSS), Proteus, PSpice, Microwind (layout), DSCH2, Arduino
- **Hardware**: Advance Circuits, Arduino-based Hardware, Microcontroller/Microprocessor-based IoT Devices

[1] Updated September 21, 2022

Publications

Journals

J2. Islam Helmy, **Pulok Tarafder** and Wooyeol Choi*, "LSTM-GRU Model-Based Channel Prediction for High Quantization Massive MIMO System", IEEE Wireless Communications Letters (under review).

J1. **Pulok Tarafder** and Wooyeol Choi*, "MAC protocols for mmWave communication: A comparative survey," *Sensors*, special issue on *"Theory and Techniques for the Deployment of Future Wireless Sensor Networks in 5G and Beyond"*, vol. 22, no. 10, article no. 3853, May 2022. (IF: 3.847 / JCR 2021) [Paper]

Conference Proceedings

C2. **Pulok Tarafder**, Moonsoo Kang and Wooyeol Choi, "A comparative study on centralized MAC protocols for 60 GHz mmWave communications", *International Conference on Information and Communication Technology Convergence (ICTC)*, Jeju, Republic of Korea, October 20-22, 2021 [Paper]

C1. Afrin Sultana Meem, Henry Bukenya, Abrar Faisal, **Pulok Tarafder**, A.K. M Abdul Malek Azad, "A qualitative study of current trends in microwave wireless power transmission including current advancements and challenges", *2019 IEEE Region 10 Symposium (TENSYMP)*, Kolkata, India, June 07-09, 2019 [Paper]

Academic Projects

P5. Self-Balancing Autonomous Unicycle using Raspberry Pi [Link]
Description: EEE414 Digital System Design Laboratory project. Designed and developed a novel way to balance a unicycle using Kalman filter algorithm on the gyroscopic data ensuring that the tilt factor is minimized.

P4. Arithmetic Logic Unit [Link]
Description: EEE412 VLSI Design Laboratory project. Designed an ALU circuit from scratch using Export DSCH2.

P3. A Solar Tracker Using ATMega32 [Link]
Description: EEE365 Microprocessors course project. Developed a solar tracker to increase the efficiency by automatically moving the solar panel by tracking the sun.

P2. The Temperature Box [Link]
Description: EEE305 Control System project. This project involved design and implementation of a feedback temperature control system.

P1. Implemented 4 variable Boolean function on PCB using Proteus.

Organization and Outreach Activities

- Attended IEEE ICC, Seoul, South Korea (16–20 May 2022)
- IEEE Graduate Student Member (Sept 2021 - present)
- Event Organizer, Brac University Electrical and Electronic Club (Feb 2014 - Dec 2018)
- Creative Designer, Robotics Club of Brac University (Jan 2014 - Dec 2016)
- Math and ICT tutor at Swarabarna Academic Care, Dhaka, Bangladesh (Nov 2015 - Apr 2017)
- Private O'Levels and A'Levels Math, Physics and Chemistry tutor (Dec 2016 - Feb 2021)

Achievements

- 1st runner-up at Automated Guided Vehicles (AGV) showcase competition, Techshopbd, Dhaka, Bangladesh (Nov 2015)
- Full-ride Research Assistant Scholarship for masters at Chosun University, Gwangju, South Korea