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Takahiro Furuya

I am a 5-th year Ph.D student in Computational Science and Engineering at Civil and Environmental Engineering School, hoping to contribute to environmental problems through the power of computational engineering.

Education

Aug.2018–present **PhD in Computational Science & Engineering**, *Georgia Institute of Technology*, Atlanta, GA, GPA: 3.75/4.0.

Apr.2016–Mar.2018 **Master of Communications Engineering**, *Tohoku University*, Sendai, Japan, GPA: 3.75/4.0.

Apr.2012–Mar.2016 **Bachelor of Information and Intelligent Systems**, *Tohoku University*, Sendai, Japan, GPA: 3.68/4.0.

Research

2018–present **Error Reduction to Global Precipitation Mission (GPM)**, *School of Civil and Environmental Engineering, Georgia Institute of Technology*, Atlanta, GA, PhD research project.

- Reduced errors in the global satellite precipitation data from 12.4 mm/day to 4.3 mm/day in RMSE
- Applied machine learning techniques (Modified Counter Propagation Network, Deep Neural Network, Recurrent Neural Network) for the reduction in Python and PyTorch
- Analyzed what errors existed in the global satellite precipitation data
- Automated the analysis process in R and Python, and parallelized the R program, which resulted in the reduction of the running time by 4 times
- Collaborated well with my direct supervisor and advisor

2016–2018 **Auto-Indexing of our Daily Life Activities from Environmental Sound**, *Tohoku University*, Sendai, Japan, Master's Research Project.

- Built the environmental sound recognition system combining Deep Neural Network (DNN), and other probabilistic models (a Hidden Markov Model and Markov Model)
- Coded the whole system in Python, with library "Chainer" for DNN
- Published the research in a proceeding, presented it in an information technology workshop and symposium
- Collaborated well with my supervisor and advisor

Experience

January.2021–May.2021, January.2022–May.2022 **Head TA in Modeling&Simulation course**, *Georgia Institute of Technology*, Atlanta, GA.

- Communicated well with students, and got high rate in the students' evaluation
- Made 1 creative problem for the Midterm exam, which helped the most to discern students with good understanding

Sept.12.2016–Sept.17.2016 **Internship at Ministry of Economy, Trade and Industry**, Tokyo, Japan.

- Worked for finding a new direction of Macro and Micro Economy of Japan
- Collaborated well in teams of 5 or 6 people
- Obtained the top award in one of the team projects

Technical and Personal skills

Programming Languages **C** (fluent), **R**, **Python**, **C++** (intermediate), **Matlab**, **HTML** and **CSS** (basic, my mock-up homepage with HTML and CSS: https://takahiro02.github.io)

Industry Software Skills **MS Office products**, **Git/Github**, **Machine learning** (PyTorch, Deep Neural Network, Hidden Markov Model, and so on), **Algorithms** (Dynamic Programming, Divide and Conquer, Branch&Bound, and so on), **Parallel Computing** (OpenMP, OpenACC, MPI, and so on), **Modeling&Simulation** (Dynamical Systems Analysis, Discrete Event Simulation, Cellular Automata, and so on)

Language Skills Japanese (Native), English (TOEFL iBT 100)

Projects

February.2022–February.2022 **Building game "Hunt the Wumpus"**, Atlanta, GA.

- Built a text-based game, "Hunt the Wumpus", and later added GUI to it in C++ as a personal project
- Used object-oriented programming techniques
- The code is at https://github.com/takahiro02/Cpp_demos

January.2019–April.2019 **Modeling of Electric Scouter Movements**, *Georgia Institute of Technology*, Atlanta, GA.

- Built the program to model the movements of electric scouters
- Implemented the code with Cellular Automata and Discrete Event Simulation methods
- Collaborated well with the teammate, and built a great relationship with him