# Cheol Jun Cho

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## EDUCATION

**Seoul National University (SNU)** **Seoul, Korea**
*B.S. in Computer Science and Engineering* *Aug 2020*
- Summa Cum Laude & the Valedictorian for the College of Engineering (GPA: 4.2/4.3)

## RESEARCH EXPERIENCE

**JeeLab, Center for Neuroscience, Brain Science Institute** **KIST, Seoul, Korea**
*Computational Neuroscience; Cognitive Neuroscience; System Neuroscience* *Jul 2020 - Present*
Research Intern, Advisor: **Dr. Jee Hyun Choi**
- Incorporating machine learning algorithms to specify and predict mice behavior patterns correlated with transient gamma oscillation in the basolateral amygdala.
- Processed and analyzed data for the wireless real-time neuro-reporting platform (CBRAIN). Developed a program to extract mouse-tracking data and neural report data from recorded videos of mouse experiments.

**Computational Clinical Science Laboratory** **SNU, Seoul, Korea**
*Computational Psychiatry; Computational Neuroscience* *Mar 2020 - Present*
Research Assistant, Advisor: **Dr. Woo-Young Ahn**
- Developing a analytical framework combining Multi-Voxel Pattern Analysis and Bayesian analysis to get brain activation patterns correlated with latent processes of human behavior.
- Designed computational models by integrating the prospect theory and the drift-diffusion model. Conducted hierarchical Bayesian analysis on risky choice task data. (choice, reaction time and eye-gaze)

**KAIST Interaction Laboratory (KIXLab)** **KAIST, Daejeon, Korea**
*Human Computer Interaction; Natural Language Processing* *Jun 2019 – Aug 2019*
Summer Research Intern, Advisor: **Dr. Juho Kim**
- Participated in the speech act based chatbot project. Designed/experimented deep learning models for the speech act classification using Bi-LSTM and word embedding models. Devised a pooling method using the attention mechanism to integrate word-wise vectors into sentence-wise vectors. Tested models on the Switchboard Dialog Act (SwDA) corpus and Verbal Response Mode dataset. Enlisted as a co-inventor in the patent application.

**Computing and Memory Architecture Laboratory (CMALab)** **SNU, Seoul, Korea**
*Computer Vision* *Dec 2018 – Jun 2019*
Research Intern, Advisor: **Dr. Sungjoo Yoo**
- Experimented an online-training framework adopting the teacher-student method to improve the computing efficiency of deep learning models. Tested the framework on the video object segmentation and the video object detection task.

## PUBLICATIONS

Kim, J., Kim, C.*, Han, H., **Cho, C.J.**, Yeom, W., Lee, S.Q*, Choi, J.H.*, A Bird's Eye View of Brain Activity in Socially Interacting Mice through Mobile Edge Computing (MEC), ***Science Advances***, *In press* (2020)

Lee, Y. **Cho, C.J.***, Kim, J., Kim, J.H., Han, H., Ahn, W., Choi, J.H., Investigation of hierarchy-dependency in the intragroup vigilance convergence and transmission, the 23rd annual meeting of ***the Korean Society for Brain and Neural Sciences***, poster presentation (2020), *selected as excellent poster (* equal contribution)*

## PROJECTS

**Bachelor's Thesis** **SNU, Seoul, Korea**
*Computer Vision; Natural Language Processing* *Mar 2020 – Jun 2020*
Independent Research
- Title: Neural Symbolic Visual Question Answering System: application to real world data and limitation
- Implemented a neural symbolic system (question-to-symbols encoder, scene graph generator, and symbolic program executor). Tested the system on General Question Answering Dataset and analyzed the associated limitations of the application.

**Brain-Mind-Behavior Independent Research Course** **SNU, Seoul, Korea**
*Natural Language Processing; Interpretable AI* *Sep 2019 – Dec 2019*
Independent Research
- Title: Deep Neural Networks with Attention Pooling for Dialogue Act Recognition
- Conducted research as an extension of work in the summer internship at KIXLab. Devised a self-attentive pooling method and compared it with the baseline (average pooling). Interpreted model inference process by analyzing attention weights.
- Received best research award in 2019 Brain-Mind-Behavior Research Presentation.

**SNU Creative Design Fair** **SNU, Seoul, Korea**
*Robotics; Human Robot Interaction (HRI); Computer Vision* *Jun 2019 – Sep 2019*
Project: Interactive Robotic Vacuum
- Participated in SNU Creative Design Fair as a team of four.
- Built a unique pointed-shape body with omnidirectional wheels. Developed the embedded AI with Arduino. Developed a smartphone app. featured by the embedded hand gesture detecting model. Devised a novel HRI platform where users interact with the robot using hand gestures.
- Won 2nd place at the SNU Creative Design Fair, and attained 1st place at the International Capstone Design Fair.

**Creative Integrated Design Course** **SNU, Seoul, Korea**
*Computer Vision; Interpretable AI* *Sep 2018 – Dec 2018*
Project: Plant Disease Detecting Web Service
- Developed a plant disease detection web service by utilizing deep learning as a team of three.
- Trained/evaluated image classification models for the plant disease detection. Visualized the inference process utilizing Guided GRAD-CAM. Implemented the back-end server for the application.

## TECHNICAL SKILLS

**Programming Languages:** Python, R, Stan, C, C++, Arduino,
**Software Packages:** Deep Learning (Pytorch , Tensorflow, Keras), Computer Vision (openCV), Natural Language Processing (Gensim, NLTK), Data Analysis (Rstan, hBayesDM), fMRI analysis (SPM12), Web Programming (Django), Machine Learning (Scikit learn)

## AWARDS AND HONORS

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| President's Award for 1st ranked graduation at SNU College of Engineering | Aug 2020 |
| Best research award from 2019 Brain-Mind-Behavior Research Presentation at SNU | Sep 2019 |
| 1st place of International Capstone Design Fair 2019 (Korea, China) | Nov 2019 |
| 2nd place of SNU Creative Design Fair of SNU College of Engineering | Sep 2019 |
| SNU's Tomorrow's Engineers Membership (honor society of college of engineering) | May 2016 |
| Korea National Scholarship (fully funded) | 2016 Spring, 2018 Fall-2019 Fall |
| Army Commendation Medal (ARCOM) | Jun 2018 |
| Certificate of Appreciation (CA) from US 8th Army | Jun 2018 |
| SNU Merit Scholarship (fully funded) | 2015 Spring,Fall |
| SNU Merit Scholarship (half funded) | 2014 Fall |

## OTHER SERVICES AND ACTIVITIES

**STEM Mini Vision Mentoring** **2016, 2019**
- Visited middle and high schools as mentor.
- Introduced Engineering School, especially about Computer Science,
- Shared my own learning strategies and experiences.

**Korean Augmentation to the United States Army (KATUSA)** **Sep 2016 - Jun 2018**
- Served in 8th Army HHB IS G4 Information Management Office.
- Supported electrical automation and equipment maintenance for operations.

**S20 project contest by Shinhan Bank** **Mar 2016 - Jun 2016**
- Won 1st place as SNU's Tomorrow's Engineers Membership team.
- Presented idea for smart banking with AI technologies.