JAYWON KOO

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RESEARCH INTERESTS

Multimodal AI, Emotion Detection, Spoken Language Processing, Computer Vision, Natural Language Processing

EDUCATION

Columbia University, New York, NY *September 2021 - December 2022*
Master of Science Student
M.S. in Computer Science - Natural Language Processing Track

Ewha Womans University, Seoul, Republic of Korea *March 2016 - August 2021*
B.S. in Computer Science and Engineering, *Magna Cum Laude*
B.S. in Self-Designed Major (Scranton Honors Program - Convergence of Science)

ACADEMIC PAPERS

- Hammad A. Ayyubi, Christopher Thomas, Lovish Chum, Rahul Lokesh, Yulei Niu, Xudong Lin, Long Chen, **Jaywon Koo**, Sounak Ray, Shih-Fu Chang "Multimodal Event Graphs: Towards Event Centric Understanding of Multimodal World ", arXiv:2206.07207 [Link]
- **Jaywon Koo** and Dongbo Min "DAT-StereoNet: Domain gap Aware Translation Stereo Network ", *(submitted)*
- **Jaywon Koo** and Dongbo Min "Nighttime Stereo Matching using Domain Adaptation", Summer Annual Conference of IEIE, 2021
- **Jaywon Koo**, Hyunseok Park et. al. "Organizing an in-class hackathon to correct PDF-to-text conversion errors of Genomics & Informatics 1.0.Genomics Inform.", Genomics & Informatics, 2020
- **Jaywon Koo** and Dongbo Min "Stereo Matching in Night-time Scene using Stereo-consistency", Korea Software Congress, 2020

RESEARCH EXPERIENCE

Speech Lab, Columbia University January 2022 - Present
Graduate Research Assistant (Adviser: Prof. Julia Hirscheberg) *New York, USA*

- Working on DARPA funded project where we develop a multi-modal model for detecting social norms, emotion, and successful communication
- Built hierarchical multimodal fusion model (preparing for ICASSP 2023)
- Built an speech emotion recognition model using HuBERT, Wav2Vec2.0 and Data2Vec

DVMM Lab, Columbia University September 2021 - December 2021
Graduate Research Assistant (Adviser: Prof. Shih-Fu Chang) *New York, USA*

- Researched on multimodal event-event relations detection where we predict relations of events in news video and newsletter
- Participated in building event-event relationship dataset
- Implemented two ways to utilize commonsense knowledge features in event-event relation detection using ConceptNet and CLIP

Computer Vision Lab., Ewha Womans University March 2019 - July 2021
Research Intern (Adviser: Professor Dongbo Min) *Seoul, Korea*

· Researched on problems of Image-to-Image Translation Network when domain gaps of source and target becomes large and submitted a paper
· Led a research on unsupervised stereo matching in low-light scene incorporating low light enhancement and denoising network, using pytorch (1 year)
· Developed a supervised way of stereo matching in low-light scene regarding stereo consistency, and wrote a paper (Korea Software Congress 2020)
· Made Night time - Day time paired stereo dataset using Lightroom (2000 pairs utilizing KITTI12/15, Citycsape, and DC datasets)

Bioinformatics Lab., Ewha Womans University July 2020 - August 2020
Research Intern (Adviser: Professor HyunSeok Park) *Seoul, Korea*

· Implemented POS(Part of Speech) tagging on biomedical data(GENIA, gni-corpus) by using BIOBERT and compared it with MLP, LSTM and BiLSTM(PyTorch).
· Participated in building Genomics & Informatics corpus.

PROJECTS

Korean Auto Speech Recognition Model September 2021 - December 2021
COMS6998: Fundamentals of Speech Recognition *Columbia University*

· Implemented Korean auto speech recognition model based on Kaldi. Applied SentencePiece tokenization and compared two models where hidden Markov model reached 38.46% of WER (Word Error Rate), and TDNN approach resulted 16.56% of WER.

Hospital Guidance Robot February 2020
AAAI-20 Student Outreach Workshop *New York, USA*

· Implemented a hospital guidance robot which finds the door automatically, navigates patients by voice and grabs object on the way. Used Cozmo robot, object recognition, and line tracking skills.

SORI(System with Omniwheel & Recognition Interface) October 2019 - November 2019

· Developed an A.I. assistant robot with omniwheels and Raspberry Pi which recognizes users and finds and carries ordered objects to other users. For face/object detection, utilized Single Shot Detection network, FaceNet, and MobileNet.
· Awarded Bronze Price in International Capstone Design Fair 2019 and second place in Ewha Engineering Capstone Design Contest

TECHNICAL SKILLS

Advanced	Programming Language(Python, C, Java), Deep Learning(Pytorch, Tensorflow, Keras), Data Warehousing/Visualization(MySQL),Version-Control System(Git), OS(Windows, MacOS, Linux, Ubuntu), OpenCV
Moderate	C++, Matlab, SPSS, LaTeX, OpenGL
Novice	Swift

AWARDS AND HONORS

Naver Best Paper Award *July 2021*
The Institute of Electronics and Information Engineers
For papers that were selected as a paper that NAVER(Company) pays attention to. 5 papers were selected in total from Summer Annual Conference of IEIE, 2021
Second Place, Graduation Project Contest *Fall 2020*
Ewha Womans University
Scholarship of Academic Excellence *Fall 2020, Spring 2021*

Ewha Womans University
For students who are in top 6% in School of Engineering

Future Competent Scholarship *Summer 2020*
Ewha Womans University
For undergraduate research interns who are recommended by the assigned professor.

Scranton Honors Program Scholarship *Spring 2016, Fall 2018, Spring 2019, Spring 2020*
Ewha Womans University
For Scranton Honors Program freshman with outstanding academic records (Total: $15,140)

TEACHING EXPERIENCE

Peer Instructor(Tutor) in Major Courses, Ewha Womans University

20481: Data Structure	*Fall 2019*
20493: Computer Architecture	*Fall 2019*
38407: C Programming and Lab	*Fall 2018*
36339: Computer Programming and Lab	*Spring 2018*