

Sangwoo Cho

PHD STUDENT

HEC 215, 4000 Central Florida Blvd, Orlando FL 32816, USA

☎ 1-919-360-8133 | ✉ sangwoo3.cho@gmail.com | 🏠 sangwoo3.github.io | 🌐 chosangwoo | 📄 Google Scholar

Research Interests

Natural Language Processing, Computer Vision, Machine Learning, Deep Learning, [Text Summarization](#), [Action Recognition](#)

Education

University of Central Florida

[Orlando, Florida, USA](#)

PHD STUDENT IN COMPUTER SCIENCE

Aug. 2015 - PRESENT

- Advisors: Hassan Foroosh and Fei Liu

University of North Carolina

[Chapel Hill, North Carolina, USA](#)

M.S IN COMPUTER SCIENCE

Dec. 2014

- Advisor: Jan-Michael Frahm

Korea University

[Seoul, S. Korea](#)

M.E IN ELECTRONICS AND COMPUTER ENGINEERING

Feb. 2007

- Thesis: Generating 2D and 3D indoor environment models for enabling interactive robot service
- Advisors: Yong-Moo Kwon and Hanseok Ko

Sogang University

[Seoul, S. Korea](#)

B.E IN ELECTRONIC ENGINEERING

Feb. 2005

- Thesis: Height measurement of arbitrary objects using a single image

Computing Skills

Programming Language C/C++, Python, Matlab, MFC, Android, Java, C#

Framework and Library Pytorch, Tensorflow, Keras, Spacy, MatConvNet, NLTK, OpenCV, OpenGL, Eigen, Qt, Protocol Buffers, Git

Experience

University of Central Florida

[Orlando, Florida, USA](#)

RESEARCH ASSISTANT

Aug. 2015 - PRESENT

- **Text summarization:** A mathematical optimization technique for an extractive summarization method, [Determinantal Point Processes \(DPP\)](#), requires similarity and importance metric for pairs. [Capsule Network](#) and [fine-tuned BERT](#) models are used to compute better sentence similarity and sentence importance scores for DPP. (Pytorch, Keras, Tensorflow, Matlab)
- **Human action recognition:** [Temporal CNN](#) and [Self-Attention network](#) are used to retrieve short and long term temporal context from videos. Methods are based on different modalities: Images, optical flows, and joints of a human body. (Pytorch, Keras, Tensorflow, Matlab)

SRI International

[Princeton, NJ, USA](#)

RESEARCH INTERN

Jun. 2019 - Aug. 2019

- Developed a Visual Question Answering (VQA) system based on a [hierarchical Transformer model](#) for explaining relations of text and image. (Pytorch)

Google

[Mountain View, California, USA](#)

SOFTWARE ENGINEER INTERN

May. 2017 - Aug. 2017

- Developed a prototype software that calibrates between eyes (a stereo camera) and a VR/AR device in order to render proper images from the point of view of two eyes. (C++, Python, OpenCV, Bash, Eigen, Ceres, Tango)

University of North Carolina

[Chapel Hill, North Carolina, USA](#)

RESEARCH ASSISTANT

Aug. 2013 - Jul. 2014

- Camera orientation estimation based on cloud image tracking (C++, Android)
- Query-based large scale image retrieval system: FINDER (C++, Python)

Samsung Electronics

RESEARCH ENGINEER

Suwon, S. Korea

Feb. 2009 – Jun. 2012

- Developed a stereo camera rectification software. (C++, OpenGL)
- Developed an intermediate viewpoint image generation software using stereo images for reducing stereo fatigue. (C++, MFC)
- Developed a stereoscopic image generation software based on 2D street-view image. (C++, MFC, Android)

ASSOCIATE RESEARCH ENGINEER

Feb. 2007 – Jan. 2009

- Developed a LTE network connection software module for a dongle device. (C, C++)
- Developed a 3D *Scratch* using VRML. (C++, MFC)

Korea Institute of Science and Technology (KIST)

Seoul, S. Korea

STUDENT RESEARCHER

Feb. 2005 – Jan. 2007

- Implemented an indoor 3D reconstruction software and designed an apparatus for data gathering consisting of a wide-view camera and a laser scanner. (C++, MFC)
- Implemented an eye gaze tracking system software. (C++, MFC)

602d Aviation Support Battalion, 2nd ID

Uijeongbu, S. Korea

PRODUCTION CONTROL OPERATOR, KATUSAs (KOREAN AUGMENTATION TO U.S. ARMY)

Nov. 2000 – Jan. 2003

- Honor Graduation (9th place) of Primary Leadership Development Course (PLDC)

Publications

Sangwoo Cho, Muhammad Hasan Maqbool, Fei Liu, and Hassan Foroosh. “Self-Attention Network for Skeleton-based Human Action Recognition.”

In Proceedings of the 2020 IEEE Winter Applications of Computer Vision Conference (**WACV**), Aspen, CO, USA, 2020

Sangwoo Cho, Chen Li, Dong Yu, Hassan Foroosh, and Fei Liu. “Multi-Document Summarization with Determinantal Point Processes and

Contextualized Representations.” In Proceedings of the 2019 Empirical Methods in Natural Language Processing (**EMNLP**), Workshop, Hong Kong, China, 2019

Sangwoo Cho, Logan Lebanoff, Hassan Foroosh, and Fei Liu. “Improving the Similarity Measure of Determinantal Point Processes for Extractive

Multi-Document Summarization.” In Proceedings of the 2019 Association for Computational Linguistics (**ACL**), Florence, Italy, 2019. (Oral)

Sangwoo Cho and Hassan Foroosh. “Spatio-Temporal Fusion Networks for Action Recognition.” In Proceedings of the 2018 Asian Conference on Computer Vision (**ACCV**), Perth, Australia, 2018

Sangwoo Cho and Hassan Foroosh. “A Temporal Sequence Learning for Action Recognition and Prediction.” In Proceedings of the 2018 IEEE Winter Applications of Computer Vision Conference (**WACV**), Lake Tahoe, NV/CA, USA, 2018

Sangwoo Cho, Enrique Dunn, and Jan-Michael Frahm. “Rotation Estimation from Cloud Tracking.” In Proceedings of the 2018 IEEE Winter Conference on Applications of Computer Vision (**WACV**), Steamboat Springs, CO, USA, 2014

Patents

KOREAN

Sangwoo Cho, Yong-Moo Kwon, Sung-Kyu Kim, Jeon Kyeong Won, Ki Jeongseok, “System And Method For 3-Dimensional Interaction Based On Gaze System And Method For Tracking 3-Dimensional Gaze.”, Patent No. 1008206390000, 2008

Sangwoo Cho, Yong-Moo Kwon, “Apparatus And Method For Creating A Circumstance Map Of An Indoor Circumstance.”, Patent No. 1007577510000, 2007

Sangwoo Cho, Yong-Moo Kwon, Sung-Kyu Kim, Jai Kyung Shul, Jinwoo Park, “Gaze-based Computer Interface Apparatus and Method of Using the Same.”, Patent No. 100651104000, 2006

Awards

2018 **Graduate Presentation Fellowship**, University of Central Florida

USA

2006 **Brain Korea 21 Program Scholarship**, Korean Research Foundation

S. Korea

2004 **1st Place**, Grand Award for Micromouse Competition at Sogang University

S. Korea

2003 **1st Place**, Grand Award for Academic Competition at Sogang University (Autonomous Mobile Robot)

S. Korea

2000 **3rd Place**, 1st National Intelligent Robot Competition

S. Korea