

# Sangwoo Cho

☎ 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](#), [Information Extraction](#)

## Education

### University of Central Florida

PHD IN COMPUTER SCIENCE

[Orlando, FL, USA](#)

May 2021

- Dissertation: Contextual Understanding of Sequential Data Cross Multi-Modalities
- Advisors: [Fei Liu](#) and [Hassan Foroosh](#)

### University of North Carolina

M.S IN COMPUTER SCIENCE

[Chapel Hill, NC, USA](#)

Dec. 2014

- Advisor: [Jan-Michael Frahm](#)

### Korea University

M.E IN ELECTRONICS AND COMPUTER ENGINEERING

[Seoul, S. Korea](#)

Feb. 2007

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

### Sogang University

B.E IN ELECTRONIC ENGINEERING

[Seoul, S. Korea](#)

Feb. 2005

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

## Experience

### Tencent AI Lab

SENIOR RESEARCH SCIENTIST

[Seattle, WA, USA](#)

Sep. 2021 - Present

### Tencent AI Lab

NLP RESEARCH INTERN, MENTOR: [XIAOYANG WANG](#), [KAIQIANG SONG](#)

[Seattle, WA, USA](#)

Jun. 2021 - Aug. 2021

- [Long document summarization](#)

### University of Central Florida

RESEARCH ASSISTANT

[Orlando, FL, USA](#)

Aug. 2015 - May 2021

- **Text summarization:** Researched summarization methods that utilize a mathematical optimization method and deep neural models for different types of documents, [news](#), [transcript](#), and [book](#): [Determinantal Point Processes \(DPP\)](#), and [Capsule Network](#) or [BERT](#) are combined for better context information retrieval; [XLNet](#) is used to find sub-sentence segments; and [VQVAE](#) is employed for training a unsupervised model. (Pytorch, Keras, Tensorflow, Matlab)
- **Human action recognition:** Researched [Temporal CNN](#) and [Self-Attention network](#) to retrieve short and long term temporal context from videos. Different modalities (images, optical flows, and body joints) are used for different methods. (Pytorch, Keras, Tensorflow, Matlab)

### Adobe Research

RESEARCH INTERN, MENTOR: [FRANCK DERNONCOURT](#), [TIM GANTER](#), [WALTER CHANG](#)

[San Jose, CA, USA](#)

May. 2020 - Sep. 2020

- Developed a [unsupervised summarization](#) system for [live streaming videos](#): a Vector Quantized Variational AutoEncoder ([VQVAE](#)) with Transformer encoder and decoder to summarize transcripts of streaming videos, which contain many chit-chats and dialogues unrelated to topics (Pytorch)

### SRI International

RESEARCH INTERN, MENTOR: [GIEDRIUS BURACHAS](#), [YI YAO](#)

[Princeton, NJ, USA](#)

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

SOFTWARE ENGINEER INTERN, MENTOR: [HAOWEI LIU](#), [DAVID GOSSOW](#)

[Mountain View, CA, USA](#)

May. 2017 - Aug. 2017

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

## University of North Carolina

RESEARCH ASSISTANT

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

Chapel Hill, NC, USA

Aug. 2013 - Jul. 2014

## Samsung Electronics

RESEARCH ENGINEER

- 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)

Suwon, S. Korea

Feb. 2007 - Jun. 2012

## Korea Institute of Science and Technology (KIST)

STUDENT RESEARCHER

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

Seoul, S. Korea

Feb. 2005 - Jan. 2007

## 602d Aviation Support Battalion, 2nd Infantry Division

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

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

Uijeongbu, S. Korea

Nov. 2000 - Jan. 2003

## Publications

---

**Sangwoo Cho**, Franck Dernoncourt, Tim Ganter, Trung Bui, Nedim Lipka, Walter Chang, Hailin Jin, Jonathan Brandt, Hassan Foroosh, and Fei Liu. “StreamHover: Livestream Transcript Summarization and Annotation” In Proceedings of the 2021 Empirical Methods in Natural Language Processing (EMNLP), 2021

**Sangwoo Cho**, Kaiqiang Song, Chen Li, Dong Yu, Hassan Foroosh, and Fei Liu. “Better Highlighting: Creating Sub-Sentence Summary Highlights” In Proceedings of the 2020 Empirical Methods in Natural Language Processing (EMNLP), 2020

**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

## Patents

---

**Sangwoo Cho**, et, al., One patent pending in the USA.

**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

---

2019 **ACL Student Volunteer**

Florence, Italy

2019 **UCF Doctoral Research Support Award**

Orlando, FL, USA

2018, 2019 **UCF Graduate Presentation Fellowship**

Orlando, FL, USA

## Computing Skills

---

**Programming Language** C/C++, Python, Matlab, Git, Java, Android, ReactJS, ㄱㄷㄹ

**ML Tools / Library** Pytorch, Tensorflow, Keras, Spacy, NLTK, MatConvNet, OpenCV, OpenGL, Eigen, Qt