Sangwoo **Cho**

PhD Student

HEC 215, Department of Computer Science, University of Central Florida, Orlando FL 32816, USA

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Research Interests

Computer Vision, Machine Learning, Natural Language Processing: Deep learning, Action recognition, Text summarization

Education

University of Central Florida — *Orlando, Florida, USA*

PhD student in Computer Science — *Aug. 2015 - PRESENT*

- Advisor: Prof. Hassan Foroosh, Prof. Fei Liu

University of North Carolina — *Chapel Hill, North Carolina, USA*

M.S in Computer Science — *Dec. 2014*

- Advisor: Prof. 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: Dr. Yong-Moo Kwon and Prof. 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++, MFC, Python, Matlab, Android, Java, LaTeX

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

Experience

University of Central Florida — *Orlando, Florida, USA*

Research Assistant — *Aug. 2015 - PRESENT*

- Human action recognition using videos [UCF101: 95.4%, HDMB51: 72.1%] with a spatio-temporal fusion network which utilizes temporal dynamic information. (Python, Keras, Tensorflow, Matlab)
- Text summarization: A trained CNN using Capsule Network outputs similarity scores for sentence pairs and is utilized to determine importance in a document. (Python, Keras, Tensorflow, Matlab)
- 3D Localization of target aerial objects using images and IMU data taken from an airplane based on two methods: two-view temporal reconstruction, trajectory based 3D motion measurement (C++, OpenCV, Eigen, Qt)

SRI International — *Princeton, NJ, USA*

Research Intern — *Jun. 2019 - Aug. 2019*

- VQA system with multiple modules based on the BERT model (Pytorch)

Google — *Mountain View, California, USA*

Software Engineer Intern — *May. 2017 - Aug. 2017*

- Developed a prototype software that calibrates between a stereo camera (mimics eyes) 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)

Samsung Electronics *Suwon, S. Korea*

Research Engineer *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, Logan Lebanoff, Hassan Foroosh, and Fei Liu. (in press) "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

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 [UCF101: 95.4%, HDMB51: 72.1%]

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 [UCF101: 92.5%, HDMB51: 66.3%]

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

Yong-Moo Kwon, Kyeong-Won Jeon, Jeongseok Ki, Qonita M Shahab, **Sangwoo Jo**, and Sung-Kyu Kim. "3D Gaze Estimation and Interaction to Stereo Dispaly". In Proceedings of the *2006 International Journal of Virtual Reality (**IJVR**)*, 2006

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*