

Sung Ju Hwang

CONTACT INFORMATION	<p>Ulsan National Institute of Science and Technology <i>Mobile:</i> +82-10-4923-9661 <i>E-mail:</i> sjhwang@unist.ac.kr <i>Homepage:</i> http://www.sungjuhwang.com <i>Home Address:</i> 50 UNIST-gil, UNIST, EB2 (106) 301-7, Eonyang-eup, Ulju-gun, Ulsan, Korea, 689-798</p>
RESEARCH INTERESTS	<p>My research interest is mainly on developing machine learning models for tackling unsolved practical challenges in various application domains, including but not limited to, visual recognition, healthcare, and natural language understanding.</p>
EDUCATION	<p>The University of Texas at Austin, Austin, Texas USA</p> <p>Ph.D., Computer Science, Aug 2013</p> <ul style="list-style-type: none">• Thesis: <i>Discriminative Object Categorization with External Semantic Knowledge</i>• Adviser: Professor Kristen L. Grauman• Area of Study: Machine Learning and Computer Vision <p>M.A., Computer Science, May 2010</p> <ul style="list-style-type: none">• Thesis: <i>Reading Between the Lines: Object Localization Using Implicit Cues from Image Tags</i>• Adviser: Professor Kristen L. Grauman• Area of Study: Computer Vision <p>Seoul National University, Seoul, Korea</p> <p>B.S., Computer Science and Engineering, February 2008</p> <ul style="list-style-type: none">• <i>Magna Cum Laude</i>, With Honors in Engineering
JOURNAL PUBLICATIONS	<p>S. J. Hwang and K. Grauman. Learning the Relative Importance of Objects from Tagged Images for Retrieval and Cross-Modal Search, <i>International Journal of Computer Vision (IJCV)</i> (IF=5.428), Oct 2011.</p> <p>S. J. Hwang and K. Grauman. Reading Between the Lines: Object Localization Using Implicit Cues from Image Tags, <i>IEEE Transaction on Pattern Analysis and Machine Intelligence (TPAMI)</i> (IF=6.085), Jun 2012.</p>
CONFERENCE PUBLICATIONS	<p>J. Kim, Y. Park, G. Kim and S. J. Hwang, SplitNet: Learning to Semantically Split Deep Networks for Parameter Reduction and Model Parallelization, TO APPEAR, In International Conference on Machine Learning (ICML), Sydney, Australia, Aug 2017. (acceptance rate = 25.5%)</p> <p>J. Yoon and S. J. Hwang, Combined Group and Exclusive Sparsity for Deep Neural Networks, TO APPEAR, In International Conference on Machine Learning (ICML), Sydney, Australia, Aug 2017. (acceptance rate = 25.5%)</p> <p>W. Goo, J. Kim, G. Kim and S. J. Hwang, Taxonomy-Regularized Semantic Deep Convolutional Neural Networks, In European Conference on Computer Vision (ECCV), Amsterdam, Netherland, Oct 2016. (acceptance rate = 26.6%)</p>

- G. Lee, E. Yang, and **S. J. Hwang**, Asymmetric Multi-task Learning Based on Task Relatedness and Loss, In International Conference on Machine Learning (**ICML**), New York City, NY, Jun 2016. (**acceptane rate = 24%**)
- J. Choi, **S. J. Hwang**, L. Sigal, and L. S. Davis, Knowledge Transfer with Interactive Learning of Semantic Relationships, In AAAI Conference on Artificial Intelligence (**AAAI**), Phoenix, AZ, Feb 2016. (**oral presentation**) (**acceptane rate = 26%**)
- A. Kuznetsova, **S. J. Hwang**, B. Rosenhahn, and L. Sigal, Exploiting View-Specific Appearance Similarities Across Classes for Zero-shot Pose Prediction: A Metric Learning Approach, In AAAI Conference on Artificial Intelligence (**AAAI**), Phoenix, AZ, Feb 2016. (**acceptane rate = 26%**)
- A. Kuznetsova, **S. J. Hwang**, B. Rosenhahn, and L. Sigal, Expanding Object Detector's Horizon: Incremental Learning Framework for Object Detection in Video In IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), Boston, MA, Jun 2015. (**acceptane rate = 25%**)
- S. J. Hwang** and L. Sigal, A Unified Semantic Emgdedding: Relating Taxonomies with Attributes In Proceedings of Advances in Neural Information Processing System (**NIPS**), Montreal, Canada, Dec 2014. (**acceptane rate = 25%**)
- S. J. Hwang**, K. Grauman, and F. Sha. Analogy-preserving Semantic Embedding for Visual Object Categorization, In Proceedings of the 2013 International Conference on Machine Learning (**ICML**), Atlanta, GA, Jun 2013. (**acceptane rate = 24%**)
- S. J. Hwang**, K. Grauman, and F. Sha. Semantic Kernel Forests from Multiple Taxonomies, In Proceedings of Advances in Neural Information Processing System (**NIPS**), Lake Tahoe, NV, Dec 2012. (**acceptance rate = 25%**)
- S. J. Hwang**, A. Kapoor, and S. B. Kang. Context-Based Automatic Local Image Enhancement, In Proceedings of the 2012 European Conference on Computer Vision (**ECCV**), Firenze, Italy, Oct 2012. (**acceptance rate = 25%**)
- S. J. Hwang**, K. Grauman, and F. Sha. Learning a Tree of Metrics with Disjoint Visual Features, In Proceedings of Advances in Neural Information Processing System (**NIPS**), Granada, Spain, Dec 2011. (**acceptance rate = 22%**)
- S. J. Hwang**, F. Sha and K. Grauman. Sharing Features Between Objects and Their Attributes, In Proceedings of the 2011 IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), Colorado Springs, CO, Jun 2011. (**acceptance rate = 22.5%**)
- S. J. Hwang** and K. Grauman. Accounting for the Relative Importance of Objects in Image Retrieval, In Proceedings of the 2010 British Machine Vision Conference (**BMVC**), Aberystwyth, UK, Sep 2010. (**oral presentation**) (**acceptance rate = 8.4%**)
- S. J. Hwang** and K. Grauman. Reading Between the Lines: Object Localization Using Implicit Cues from Image Tags, In Proceedings of the 2010 IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), San Francisco, CA, Jun 2010. (**oral presentation**) (**acceptance rate = 4.5%**)
- WORKSHOP PRESENTATIONS
- A. Kuznetsova, **S. J. Hwang**, B. Rosenhahn and L. Sigal. A Metric Learning Approach for Multi-View Object Recognition and Zero-shot Pose Estimation, ICCV Workshop on Object Understanding for Interaction, ICCV 2015, Santiago, Chile, Dec 2015.
- J. Choi, **S. J. Hwang**, L. Sigal and L. S. Davis. Interactive Semantics for Knowledge Transfer, ICML Active Learning Workshop, ICML 2015, Lille, France, July 2015.

S. J. Hwang and L. Sigal and L. S. Davis. A Unified Semantic Embedding: Relating Taxonomies and Attributes, AAAI Spring Symposium on Knowledge Representation and Reasoning (KRR), KRR 2015, Stanford, CA, Mar 2015.

S. J. Hwang and L. Sigal and L. S. Davis. A Unified Semantic Embedding: Relating Taxonomies and Attributes, NIPS Workshop on Learning Semantics, NIPS 2014, Montreal, Canada, Dec 2014.

S. J. Hwang, F. Sha, and K. Grauman. Semantic Kernel Forests from Multiple Taxonomies, International Workshop on Large Scale Visual Recognition and Retrieval (**BigVision**), NIPS 2012, Lake Tahoe, NV, Dec 2012. (**oral presentation**)

S. J. Hwang, F. Sha, and K. Grauman, Sharing Features Between Visual Tasks at Different Levels of Granularity, Fine-Grained Visual Categorization Workshop (**FGVC**), CVPR 2011, Colorado Springs, CO, Jun 2011.

PATENTS

S. J. Hwang and L. Sigal, Incremental Category Embedding for Categorization, US 9317782 B2, Apr 2016

S. J. Hwang, J. Choi and L. Sigal, Object Classification Through Semantic Mapping, US 20160292538 A1, Mar 2015

CONFERENCE PROGRAM COMMITTEE & REVIEWER SERVICES

- 2012, 2013 *IEEE Transaction on Multimedia*
- 2014 *ACM SIGGRAPH*
- 2014 *ACM SIGGRAPH Asia*
- 2012, 2014 *European Conference on Computer Vision (ECCV)*
- 2012, 2013, 2014 *Neural Information Processing System (NIPS)*
- 2015, 2016, 2017 *International Conference on Machine Learning (ICML)*
- 2016, 2017 *AAAI Conference on Artificial Intelligence (AAAI)*
- 2016 *International Joint Conference on Artificial Intelligence (IJCAI)*
- 2017 *International Conference on Artificial Intelligence and Statistics (AISTATS)*
- 2012, 2014 *Asian Conference on Computer Vision (ACCV)*
- 2013, 2014, 2015 *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*
- 2013, 2017 *International Conference on Computer Vision (ICCV)*
- 2014 *CVPR Workshop on Egocentric Vision (EgoVision)*
- 2014 *ECCV Workshop on Storytelling with Images and Videos (VisStory)*
- 2016 *Eurographics (EG)*

AWARDS

The University of Texas at Austin

- Dean's Excellence Award from the College of Natural Sciences, 2010

Seoul National University

- Merit-based Scholarship (6 times)

GRANTS

- Human-Inspired Large Scale Visual Recognition System (12/2015-11/2017) (PI), ₩500M, Samsung Research Funding Center of Samsung Electronics
- Affective Conversational Agents (5/2017 - 4/2018) (PI), ₩200M, Naver
- Semantic-Based Interactive Learning System for Visual Recognition (11/2015-10/2018) (PI), ₩150M, National Research Foundation
- Petaflop-Scale Machine Learning Framework - Next Generation High-Performance Computing (11/2016-07/2021) (Co-PI), ₩100M per year, National Research Foundation
- Multitask Deep Learning Models for Disease Prediction from Electronic Health Records (04/2017-09/2017) (PI), ₩70M, AITrics

- Semantic and Contextual Dialogue Generation Using Generative Adversarial Networks (04/2017-12/2017) (PI), ₩80M, SKT
- Deep Learning-Based Survivor Detection System for Unmanned Aerial Vehicles (09/2016-07/2017) (PI), ₩60M, National Research Foundation
- Incremental Learning for Object Detection, Pose Estimation, and Object Trajectory Estimation (09/2016-08/2017) (PI), ₩72.25M, Hyundai Motor Company
- Automatic Vibration Analysis using Deep Learning (07/2016-03/2017) (PI), ₩55M, Hyundai Motor Company
- Simultaneous Object/Scene Recognition and Learning from Driving Videos (12/2015-5/2016) (PI), ₩30M, Hyundai NGV
- Hazard/Accident Prediction and Evasion System Leveraging Big Data (12/2015-5/2016) (PI), ₩30M, Hyundai NGV

INVITED TALKS

Human-Inspired Extremely Large Scale Visual Recognition System

- Samsung Advanced Institution of Technology, Suwon, Korea
- Software Convergence Symposium 2017 (SWCS 2017), Seoul, Korea
- The 6th Winter School on Image Understanding, Gangwon, Korea
- Ulsan National Institute of Science and Technology, Ulsan, Korea

Extreme-Scale Deep Learning Framework for Petaflop-Scale Supercomputers

- Computer System Society Winter School, Gangwon, Korea

Deep Learning Methods for Object Detection on UAVs

- The 13th Short Course on UAV Technology: Guidance, Navigation, and Control, Seoul, Korea

Learning a Semantic Space for Recognition and Inference

- Pohang University of Science and Technology, Pohang, Korea
- Chonnam National University, Gwangju, Korea

Exploiting View-Specific Appearance Similarities Across Classes for Zero-shot Pose Prediction

- 2015 Korean Conference on Computer Vision, Seoul, Korea

A Unified Semantic Embedding: Relating Taxonomies with Attributes

- 2014 Korean Conference on Computer Vision, Seoul, Korea

Discriminative Object Categorization with External Semantic Knowledge

- VASC Seminar, Carnegie Mellon University, Pittsburgh, PA
- Ulsan National Institute of Science and Technology, Ulsan, Korea
- Chonnam National University, Gwangju, Korea
- Chungbuk National University, Cheongju, Korea

RESEARCH EXPERIENCE

Ulsan National Institute of Science and Technology,

Assistant Professor

08/26/2014-Current

- Conducting research on machine learning for visual recognition, healthcare, and natural language understanding

Disney Research,

Postdoctoral Research Associate

09/16/2013-8/24/2014

- Conducted research on feature learning and categorization model learning for large-scale and fine-grained categorization.
- Mentor: Leonid Sigal, Senior Research Scientist

Microsoft Research,

Research Intern

06/06/2011-09/02/2011

- Researched and developed an automatic image enhancement system, which finds an optimal enhancement map for a given image, with coarse-to-fine search for the optimal pixelwise enhancement operators using localized hashing on the learned metrics, followed by a Gaussian process smoothing step (ECCV 2012).
- Mentors:
Sing Bing Kang, Principal Researcher
Ashish Kapoor, Researcher

The University of Texas at Austin,

Research Assistant

08/16/2009-08/16/2013

- Performed research on solving various computer vision tasks (object detection, image retrieval, automatic image annotation, object categorization) with machine learning approaches (multi-view learning, multitask learning, metric learning, multiple kernel learning, manifold/embedding learning).

PROFESSIONAL
EXPERIENCE

SK Communications (EMPAS), Seoul, South Korea

Lead Staff, System Programmer - Search Departement **07/16/2005-01/11/2007**

- Served as a system programmer for the search development team.
- Performed periodic experiments on disk and DB performance, built search logging tools, conducted search log analysis, and reported results.

Comin Information Systems, Gwangju, South Korea

Programmer & Researcher - R&D Department

02/24/2004-07/15/2005

- Served as a researcher and programmer for several mission-critical projects, including development of a license plate recognition parking system, medical imaging simulator, and 3D graphics engine.

REFERENCES

- Kristen Grauman (grauman@utexas.edu)
- Fei Sha (feisha@usc.edu)
- Sing Bing Kang (sbkang@microsoft.com)
- Ashish Kapoor (akapoor@microsoft.com)
- Leonid Sigal (lsigal@disneyresearch.com)

CITIZENSHIP

- Republic of Korea

DATE OF BIRTH

- February 15th, 1982