SUNGMIN HONG

Postdoctoral Research Fellow, MGH, HMS

shong20@mgh.harvard.edu ⋄ +1 801 209 5697
Suite 300, 175 Cambridge Street, Boston, MA, 02114
https://www.sungminhong.com

CURRENT POSITION

Postdoctoral Research Fellow *2020 -*
JPK Stroke Research Center
Department of Neurology,
Massachusetts General Hospital
Harvard Medical School
Advisor : Prof. Natalia S. Rost (HMS)
Co-Advisor : Prof. Polina Golland (MIT)

EDUCATION

Ph.D. in Computer Science *2015 - 2020*
Dissertation: Regression Analysis of Continuous Medial Representations on a Riemannian Manifold for the Analysis of Anatomical Shape Change
New York University
Department of Computer Science and Engineering, Tandon School of Engineering
Advisor : Prof. Guido Gerig

Ph.D. in Computing* *2014 - 2015*
University of Utah, *Transferred to New York University
School of Computing, Image Analysis Track
Advisor : Prof. Guido Gerig

M.Sc. in Electrical Engineering and Computer Science *2013*
Seoul National University
Department of Electrical Engineering and Computer Science
Advisor : Prof. Sang-Uk Lee and Prof. Il-Dong Yun

B.Sc. in Electrical Engineering *2011*
Seoul National University
Department of Electrical Engineering and Computer Science

PUBLICATIONS

Peer-reviewed Journals

- **Sungmin Hong**, Razvan Marinescu, Adrian V. Dalca, Anna K. Bonkhoff, Martin Bretzner, Natalia S. Rost, and Polina Golland "(Tentative) Atlas Estimation and Progression Modeling on StyleGAN Latent Space for Medical Images with Non-Geometric Changes," *In preparation.*
- **Sungmin Hong**, James Fishbaugh, and Guido Gerig "Geodesic Regression Model of Continuous Medial Shape Representations for the Analysisof Morphological Change of Anatomical Shapes", *In preparation*
- **Sungmin Hong**, Anne-Katrin Giese, Markus D. Schirmer, Anna K. Bonkhoff, Martin Bretzner, Pamela Rist, ..., and Natalia S. Rost, " Excessive White Matter Hyperintensity Increases Susceptibility to Poor Functional Outcomes after Acute Ischemic Stroke," Frontiers in Neurology, *Accepted, To appear.*

- Martin Bretzner, Anna K. Bonkhoff, Markus D. Schirmer, **Sungmin Hong**, ..., and Natalia S. Rost, "MRI Radiomic signature of white matter hyperintensities is associated with clinical phenotypes," Frontiers in Neuroscience, July 2021.
- Anna K. Bonkhoff, Markus D. Schirmer, Martin Bretzner, **Sungmin Hong**, ..., and Natalia S. Rost, "Outcome after acute ischemic stroke is linked to sex-specific lesion patterns", Nature Communications, June 2021.
- Neel Dey, **Sungmin Hong**, Thomas Ach, Yiannis Koutalos, Christine A. Curcio, R. Theodore Smith, Guido Gerig, "Tensor Decompositions of Hyperspectral Images of Autofluorescent Retinal Tissue", MedIA, May 2019.
- Yuehong Tong, Tal Ben Ami, **Sungmin Hong**, Rainder Heintzmann, Guido Gerig, Zsolt Ablonczy, Christine A. Curcio, Thomas Ach, R. Theodore Smith, "Hyperspectral autofluorescence imaging of drusen and retinal pigment epithelium in donor eyes with age-related macular degeneration", Retina, Vol 36, p. S127, 2016.
- Joonghee Kim, Kyuseok Kim, **Sungmin Hong**, Bojun Kwon, Il Dong Yun, Byung Se Choi, Cheolkyu Jung, Jae Hyuk Lee, You Hwan Jo, Taeyun Kim, Joon Eui Rhee and Soo Hoon Lee, "Low apparent diffusion coefficient cluster-based analysis of diffusion weighted MRI for prognostication of out-of-hospital cardiac arrest survivors", Resuscitation, April, 2013.
- **Sungmin Hong**, Hackjoon Shim and Yoojin Chung, "Tracking of mitochondrial transports using a particle filtering method with a spatial contraint", Optical Engineering, Vol. 50, No. 9, September 2011.

Peer-reviewed Conference Proceedings

- **Sungmin Hong**, Razvan Marinescu, Adrian V. Dalca, Anna K. Bonkhoff, Martin Bretzner, Natalia S. Rost, and Polina Golland, "3D-StyleGAN: A Style-Based Generative Adversarial Network for Generative Modeling of Three-Dimensional Medical Images", Deep Generative Models Workshop:MICCAI 2021 *Accepted, To appear.*
- Heejong Kim, **Sungmin Hong**, Martin Styner, Jason Wolff, and Guido Gerig, "Hierarchical Geodesic Modeling on the Diffusion Orientation Distribution Function for Longitudinal DW-MRI Analysis", MICCAI 2020.
- **Sungmin Hong**, James Fishbaugh, Jason Wolff, Martin Styner, and Guido Gerig, "Hierarchical Multi-Geodesic Model for Longitudinal Analysis of Temporal Trajectories of Anatomical Shape and Covariates," MICCAI, 2019.
- **Sungmin Hong**, James Fishbaugh and Guido Gerig, "4D continuous medial representation trajectory estimation for longitudinal shape analysis," MICCAI Workshop:Shape-MI, 2018.
- Mathilde Ravier, **Sungmin Hong**, Charly Girot, Hiroshi Ishikawa, Jenna Tauber, Gadi Wollstein, Joel Schuman, James Fishbaugh and Guido Gerig, "Analysis of morphological changes of the lamina cribrosa under acute intraocular pressure change," International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2018.
- Yu Zhao, Shu Liao, Yimo Guo, Liang Zhao, Zhennan Yan, **Sungmin Hong**, Gerardo Hermosillo, Tianming Liu, Xiang Zhou and Yiqian Zhan, "Toward MR-Only radiotherapy treatment planning:Synthetic CT generation using multi-view deep convolutional neural networks," International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI), 2018.
- **Sungmin Hong**, James Fishbaugh and Guido Gerig, "4D contiuous medial representation by geodesic shape regression," 2018 IEEE 15th International Symposium on Biomedical Imaging (ISBI 2018), 2018.
- **Sungmin Hong**, James Fishbaugh, Morteza Rezanejad, Kaleem Siddiqi, Hans Johnson, Jane Paulsen, Eun Young Kim and Guido Gerig, "Subject-specific longitudinal shape analysis by coupling spatiotemporal shape modeling with medial analysis," SPIE Medical Imaging 2017:Image Processing, 2017.
- **Sungmin Hong**, Bojun Kwon, Il Dong Yun, Sang Uk Lee, Kyuseok Kim and Joonghee Kim , "Prediction of the potential clinical outcomes for post-resuscitated patients after cardiac arrest," SPIE Medical Imaging 2013:Image Processing, 2013.

Selected Abstracts

- **Sungmin Hong**, Mathilde Ravier, Hiroshi Ishikawa, Charly Girot, Jenna Tauber, Gadi Wollstein, Joel S Schuman, James Fishbaugh and Guido Gerig, "Groupwise 3D nonlinear registration of OCT image series for analyzing dynamic lamina cribrosa changes," Investigative Ophthalmology and Visual Science (IOVS), The Association for Research in Vision and Ophthalmology (ARVO), 2018.
- James Fishbaugh, **Sungmin Hong**, Hiroshi Ishikawa, Mathilde Ravier,Gadi Wollstein, Joel S Schuman and Guido Gerig, "Stability analysis of lamina cribrosa structure in repeated optical coherence tomography scans," Investigative Ophthalmology and Visual Science (IOVS), The Association for Research in Vision and Ophthalmology (ARVO), 2018.
- Thomas Ach, **Sungmin Hong**, Rainer Heintzmann, Jost Hillenkamp, Kenneth R Sloan, Neel S Dey, Guido Gerig, Theodore Smith, Christine Curcio and Katharina Bermond, "High-resolution and multispectral imaging of autofluorescent retinal pigment epithelium(RPE) granules," Investigative Ophthalmology and Visual Science (IOVS), The Association for Research in Vision and Ophthalmology (ARVO), 2017.
- Neel Dey, **Sungmin Hong**, Yuehong Tong, Taariq Mohammad, Rainer Heintzmann, Martin Hammer, Guido Gerig, Christine Curcio, Thomas Ach, Zsolt Ablonczy and Theodore Smith, "Consistent automatic spectral signature recovery of human retinal pigment epithelium(RPE) lipofuscin components and drusen in donores with age-related macular degeneration (AMD) using multi-excitation hyperspectral autofluorescence (AF) imaging," Investigative Ophthalmology and Visual Science (IOVS), The Association for Research in Vision and Ophthalmology (ARVO), 2017.

ORGANIZATION/REVIEW

Session Chair: Differential Geometry, IPMI, 2021

Organizer: Int'l Nonlinear Shape Statistics Discussion Meeting, 2020-

Reviewer: Medical Image Analysis, 2021-

Reviewer: Journal of Mathematical Imaging and Vision, 2021-

Reviewer: Stroke, 2021-

Reviewer: MICCAI, 2018-

Reviewer: Workshop on Shape in Medical Imaging, MICCAI, 2020-

Reviewer: ISBI, 2019-2020

INVITED TALKS

Woo Lab, Gordon Center for Medical Imaging, Harvard Medical School *9th July 2021*
Latent Space Statistics on StyleGAN Latent Space: Atlas Estimation and Brain Morphometry for Brains with Non-Geometric Changes.

A.A. Martinos Center for Biomedical Imaging, Harvard Medical School *24th May 2021*
Latent Space Statistics on StyleGAN Latent Space: Atlas Estimation and Brain Morphometry for Brains with Non-Geometric Changes.

Medical Vision Group, MIT CSAIL *7th May 2021*
Latent Space Statistics on StyleGAN Latent Space: Application to Atlas Estimation for Images with Non-Geometric Changes.

Int'l Nonlinear Shape Statistics Discussion Meeting *23rd April 2021*
3D-StyleGAN: A Style-Based Generative Adversarial Network for Generative Modeling of 3D Medical Images.

University of Pennsylvania *14th August 2019*
Longitudinal Analysis of Anatomical Shape Change by Regression Models on Riemannian Manifolds.

University of North Carolina, Chapel Hill *26th October 2018*
Continuous Spatio-Temporal Trend Estimation of Shape Changes from Sparsely Distributed Shapes over Time with Continuous Medial Representations.

AWARDS AND SCHOLARSHIPS

Outstanding Reviewer, Honorable Mention, MICCAI, 2021

School of Engineering Fellowship, Tandon School of Engineering, New York University, 2018

Deborah Rosenthal, MD Award(Best PhD qualification exam award),
Tandon School of Engineering, New York University, 2017

Best Exhibit Award, Research Expo, Tandon School of Engineering, New York University, 2017

Graduate Fellowship, School of Computing, University of Utah, 2014

BrainKorea21 Award for Excellent Research Achievement,
Ministry of Education and Human Resources Development, South Korea, 2012

BrainKorea21 Award for Excellent Research Paper,
Ministry of Education and Human Resources Development, South Korea, 2012

National Science and Technology Scholarship,
National Research Foundation of Korea, South Korea, 2004

RESEARCH EXPERIENCE

Massachusetts General Hospital, Harvard Medical School *March 2020 - Current*
Postdoctoral Research Fellow

New York University *January 2020 - March 2020*
Postdoctoral Research Scientist

New York University *September 2015 - January 2020*
Research Assistant

Siemens Healthineers *May 2017 - August 2017*
Research Intern
Medical Solutions - Siemens Healthineers USA

Chevron Corporation *June 2015 - August 2015*
Earth Science Intern
Earth Sciences Department R&D, Chevron Energy Technology Company

Seoul National University *March 2011 - Feb 2014*
Research Assistant

Seoul National University *September 2009 - December 2010*
Undergraduate Research Assistant

TEACHING EXPERIENCE

Seoul National University *March 2011 - June 2011*
Teaching Assistant
Signals and Systems - Prof. Sang-Uk Lee