

# LIU, SHIKUN

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- RESEARCH INTERESTS**
- Self-Supervised & Meta Learning*: To design learning systems with the ability to acquire knowledge versatility and induce learning algorithms given no or minimal human prior knowledge.
  - Multi-task & Continual Learning*: To design learning systems which can incrementally update a general representations for real-time interpretation, action and manipulation.
- EDUCATION**
- Imperial College London | London, England**
- Doctor of Philosophy in Visual Perception and Robotics Oct. 2019 - Sept. 2023 (expected)  
*Advisor*: Prof. Andrew Davison FEng & Dr. Edward Johns  
*Research Direction*: Self-Supervised Learning, Planning and Control
  - Master of Research in Advanced Computing (*with Distinction*) Sept. 2017 - Oct. 2018  
*Advisor*: Prof. Andrew Davison FEng & Dr. Edward Johns  
*Thesis*: Universal Representations: Towards Multi-Task Learning & Beyond
- The Pennsylvania State University | State College, Pennsylvania**
- Bachelor of Science in Mathematics & Electrical Engineering (*with Honors*) Aug. 2013 - May. 2017  
*Advisor*: Prof. C. Lee Giles  
*Thesis*: Variational Generative Models
- EXPERIENCE**
- Research Assistant, Imperial College London | London, England**
- *Dyson Robotics Lab & Robot Learning Lab* Oct. 2017 - present.
    - Working with Prof. Andrew Davison & Dr. Edward Johns.
    - Working on numerous projects in multi-task and auxiliary learning with applications in computer vision and robotics.
- Research Intern, Tencent | Shanghai, China**
- *Medical Analysis Group, YouTu Lab* Jul. 2017 - Sept. 2017
    - Contributed to the Tencent Medical AI project.
    - Proposed a multi-resolution 3D feature pyramid network based on attention, a patented research for early-stage lung cancer detection.
    - Improved diabetic retinopathy screening with attention visualisation.
- Research Assistant, The Pennsylvania State University | State College, Pennsylvania**
- *The Intelligent Information Systems Research Lab* Jan. 2017 - May. 2017
    - Worked with Prof. C. Lee Giles & Dr. Alexander Ororbia II.
    - Proposed a hierarchical latent-variable model, the Variational Shape Learner, for general voxelized 3D shape understanding.
    - Achieved state-of-the-art unsupervised ModelNet dataset classification and significantly improved the quality of shape generation and single image 3D model retrieval.
- Research Intern, Carnegie Mellon University | Pittsburgh, Pennsylvania**
- *CI2CV Computer Vision Lab, The Robotics Institute* May. 2016 - Nov. 2016
    - Worked with Prof. Simon Lucey.
    - Designed a deep generative architecture based on convolutional neural network and variational auto-encoder for pose-aware image reconstruction.

- PUBLICATIONS
1. Shikun Liu, Edward Johns, and Andrew J. Davison “End-to-End Multi-Task Learning with Attention.” *Computer Vision and Pattern Recognition (CVPR)*, 2019. [upon review.]
  2. Shikun Liu, Edward Johns, and Andrew J. Davison “Self-Supervised Generalisation with Meta Auxiliary Learning.” *International Conference on Machine Learning (ICML)*, 2019. [upon review.]
  3. Shikun Liu, C. Lee Giles, and Alexander G. Ororbia II. “Learning A Hierarchical Latent-Variable Model of 3D Shapes.” *International Conference on 3D Vision (3DV)*, 2018. [Oral Presentation.]

TECHNICAL PROFICIENCY

*Programming*  
 C/C++, Python\*, Haskell, HTML/CSS\*

*Software / Framework*  
 Tensorflow\*, PyTorch\*, OpenCV\*, MATLAB\*, Mathematica, L<sup>A</sup>T<sub>E</sub>X\*

(\* ) implies a sufficient level of expertise.

HONORS & AWARDS	Distinguished Project, Department of Computing at Imperial College	Sept. 2018
	Schreyer Honors College Summer Research Grant	May. 2016
	Penn State Math Department Research Grant	Oct. 2013
	Shanghai Intel and Engineering Fair - Best Paper Award	Jan. 2013
	Shing-Tung Yau Mathematics Awards - Second Prize	Sept. 2012