Jenny Han Lin

Contact Info

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Education

Carnegie Mellon University (CMU) September 2017 - Current
Ph.D. in Computer Science

Massachusetts Institute of Technology (MIT) September 2011 - June 2015
Bachelors of Engineering, Class of 2015.
- Major: 6-7: Computer Science and Molecular Biology.
- GPA: 4.7 / 5.0.

Publications

J. Lin*, V. Narayanan, and J. McCann.
Efficient Transfer Planning for Flat Knitting.
SCF 2018.

C. Jiang*, Y. Zhu*, S. Qi*, S. Huang*, **J. Lin**, X. Guo, L.-F. Yu, D. Terzopoulos, and S.-C. Zhu.
Configurable 3D Scene Synthesis and 2D Image Rendering with Per-pixel Ground Truth Using Stochastic Grammars.
IJCV 2018.

J. Lin*, J. Kubricht*, Y. Zhu*, H. Lu, and S.-C. Zhu.
Visuomotor Adaptation and Sensory Recalibration in Reversed Hand Movement Task.
CogSci 2017.

J. Lin*, X. Guo*, J. Shao*, C. Jiang, Y. Zhu, and S.-C. Zhu.
A Virtual Reality Platform for Dynamic Human-Scene Interaction.
SIGGRAPH Asia Workshop on Virtual Reality Meets Physical Reality, 2016.

MT. Gravina, **J. Lin**, and S.S. Levine.
Lane-by-lane sequencing using Illumina's Genome Analyzer II.
Biotechniques, 2013. 54(5):265-9.

N. Danilova, A. Kumagi, and **J. Lin**.
p53 upregulation is a frequent response to deficiency of cell-essential genes.
PLoS One, 2010. 5(12):e15938.

Abstracts / Posters

Z. Banks, V. L. Butty, **J. Lin**, and S. S. Levine.
Which RNA-Seq processing algorithm should I pick?
A comparison of RNA-Seq pipelines based on experimental parameters.
The 14th annual Advances in Genome Biology and Technology, 2013.

Awards and Scholarships

MIT iOS Game Competition, MIT
3rd place 2014

Donald A. King Summer Research Fellowship, University of California, Los Angeles
One of three recipients 2013

Research Experience in Computer Vision and Graphics

⋆ On-Demand Machine Knitting.
with Carnegie Mellon University Textiles Lab.
September '17 - Present
Phd Student Advisor: **Prof. James McCann**, CMU
- Goal: to transform the design pipeline for industrial knitting machines into one that is accessible and intuitive for all levels of users.
- Created basic low-level knitting machine planning algorithms for simple flat patterns.
- Developed discrete, generalizable representation of the knitting machine state for more tractable computational planning.

⋆ Large-Scale, Photorealistic, RGB-D Image and Ground Truth Synthesis by Sampling Stochastic Grammars Representing Indoor Scenes.
with UCLA Center for Vision, Cognition, Learning and Autonomy (VCLA).
August '16 - November '16
Staff Research Associate — Advisor: **Prof. Song-Chun Zhu**, UCLA

– Goal: to provide a set of diagnostics benchmarks on several common computer vision tasks by precisely customizing and controlling important attributes of the synthesized scenes.
– Helped render half a million photorealistic images of indoor scenes.

⋆ Unified Benchmark for Robotics & Computer Vision using Virtual Reality & Physics Engine.
with UCLA Center for Vision, Cognition, Learning and Autonomy (VCLA).
March '16 - August '17
Staff Research Associate — Advisor: **Prof. Song-Chun Zhu**, UCLA

– Goal: to provide a unified benchmark for robotics and high-level computer vision tasks inside virtual environments using state-of-the-art real-time physics-based simulations.
– Integrated Unreal Engine 4 with Oculus Rift headset, Leap Motion sensor and Kinect v2 sensor to simultaneously track human body and hand poses in virtual environments.
– Preliminary results on platform has been published through SIGGRAPH Asia Workshop 2016 on Virtual Reality Meets Physical Reality.
– Implemented a variety of simulated tasks while improving human-virtual scene interaction.

Research Experience in Cognitive Science

⋆ Comparing Human Performance on Planning & Executions in Real-world & Virtual Reality.
with UCLA Center for Vision, Cognition, Learning and Autonomy (VCLA).
September '16 - August '17
Staff Research Associate — Advisor: **Prof. Song-Chun Zhu**, UCLA and **Prof. Philippe Schyns**, University of Glasgow

– Goal: to evaluate the differences of human performance on planning and executions between real-world scenarios and virtual environments.
– Designed experimental setup to make virtual tasks comparable to corresponding real world tasks.
– Set up virtual scenes to match real world counterparts.

⋆ Visuomotor Adaptation and Sensory Recalibration in Reversed Hand Movement Task.
with UCLA Center for Vision, Cognition, Learning and Autonomy (VCLA).
October '16 - February '17
Staff Research Associate — Advisor: **Prof. Song-Chun Zhu**, UCLA and **Prof. Hongjing Lu**, UCLA

– Goal: to evaluate the ability of humans to adapt motor skills to conflicting visual feedback
– Used Oculus Touch controllers to map motion of virtual hands to a different axis.
– Designed experimental setup to evaluate human performance.

Research Experience in Computational Biology

⋆ Improved Homotypic Binding Event Discovery Using Paired-End Sequencing Data.
with MIT Computer Science and Artificial Intelligence Laboratory (CSAIL).
June '14 - June '15
Undergrad Researcher — Advisor: Drs. **Yuchun Guo** and **David Gifford**, MIT

– Goal: to improve the spatial accuracy of protein-DNA binding site detection by incorporating information from paired-end sequencing tags
– Modified existing sequencing data analysis method Genome Positioning System to use paired-end data.
– Compared accuracy of new analysis method to several existing methods.

⋆ Computational Analysis of Gene Expression in Huntington's Disease Patients and Mouse Models.
with UCLA Semel Institute.
June '13 - September '13
Undergrad Researcher — Advisor: Drs. **William Yang** and **Steve Horvath**, UCLA

– Goal: to determine genetic similarity between HD patients and disease mouse models as well identify gene sets with irregular expression
– Analyzed RNA expression in Huntingtons disease patients and corresponding mouse models.
– Presented findings at Huntington's Disease Society of America 2014 Convention.

⋆ Lane-by-lane sequencing using Illumina's Genome Analyzer II.
with BioMicro Center, MIT.
June '12 - August '13
Undergrad Researcher Advisor: Dr. **Stuart Levine**, MIT

– Goal: to allow researchers to perform genome sequencing on partial flowcells, thus saving reagents on small experimental batches.
– Created pipeline to convert existing .json files with full flowcell sequencing instructions into partial flowcell instructions.
– Results and pipeline published in Biotechniques.

⋆ Which RNA-Seq processing algorithm should I pick? A comparison of RNA-Seq pipelines based on experimental parameters.
with BioMicro Center, MIT.
June '12 - August '13
Undergrad Researcher Advisor: Dr. **Stuart Levine**, MIT

– Goal: to determine how the performance of different RNA-Seq processing algorithms vary across different parameters.
– Quantized and compared the performance of eight different algorithms across different read densities and paired vs single end sequencing.
– Results presented at Advances in Genome Biology and Technology, 2013.

⋆ p53 upregulation is a frequent response to deficiency of cell-essential genes.
with Department of Molecular, Cell & Developmental Biology, UCLA.
Sept '07 - March '11
Student Researcher Advisor: Dr. **Nadia Danilova**, UCLA

– Goal: to determine the involvement of p53 in birth defects due to genetic mutations
– Performed PCR, Western blot analysis and zebrafish husbandry.

Work and Teaching Experience

⋆ **TA for Knitout Office Hours** October '18 - Present
– Answer questions about knit programming at weekly sessions where the knitting machine is available for usage by the greater CMU community
– Wrote initial tutorial knitout posts, available at the textiles lab website
⋆ **Software Engineer at 3BlackDot** January '16 - June '16
– Developed three minute Virtual Reality demo.
– Added dedicated servers to existing video game Dead Realm.
⋆ **Software Intern at Square Enix, Japan** July '15 - November '15
– Goal: to explore the applications of Virtual Reality in video game production.
– Developed two-player asymmetrical game which combined perspective tracking with Virtual Reality.

Skills

– Programming: C++, Javascript, Knitout, Matlab, Python, Java, R, Objective C
– Biology: DNA, RNA preparation, PCR, Western blot analysis, animal husbandry
– Language: English (native), Japanese (working proficiency), Chinese (working proficiency)