

Junbang Liang

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Educational Background:

- **University of Maryland, College Park** Aug. 2018 - Present
 - Ph.D. student in Department of Computer Science
- **University of North Carolina at Chapel Hill** Aug. 2016 - June 2018
 - Master's degree of Computer Science
 - 9/9 High Pass, equivalent to GPA 4.0/4.0
- **Tsinghua University** Sep. 2012 - Jul. 2016
 - Bachelor of Engineering in Department of Computer Science and Technology.
 - Overall GPA 3.8/4.0 (91/100), Total Credits 173, Rank 9/141.

Research Experience:

- **Research Assistant in GAMMA lab** Aug. 2016 - Present
Supervisor: Prof. Ming C. Lin
 - Developed a pipeline to train a neural network model and predict material parameters of a moving cloth from videos. We generated synthetic training data using physically-based simulation engine and feed it to a CNN-LSTM integrated network. Final prediction performance is comparable to human perception.
 - Developed a scalable technique to parallelize cloth simulation in time domain. Used load balancing theory to maximize the speedup and introduced an iterative recovery algorithm to solve time dependency issues. We achieved a speedup close to linear with 128 CPU cores without losing too much accuracy.
- **Research Intern in Lab of Computer Graphics, Tsinghua University** Apr. 2014 - Dec. 2016
Supervisor: Prof. Shi-Min Hu
 - Worked in automatic stereoscopic video synthesis from multiple hand-held monocular cameras. Implemented the algorithm of *Unstructured Lumigraph Rendering* as the first step of the synthesis.
 - Developed a technique of automatically warping stereoscopic videos to an appropriate and comfortable depth range. Implemented *Iterative Nonlinear Least Squares* problem when optimizing energy function. The project has been published to CVM 2016.
- **Summer Internship in Robotic Institute, CMU** Jul. 2015 - Sep. 2015
Supervisor: Prof. Stelian Coros
 - Developed an application to automatically generate 3D-printable robots from user-designed models. Implemented *Finite Element Method* simulation and 3D swept volume algorithm.
- **Research Intern in Lab of Artificial Intelligence, Tsinghua University** Nov. 2014 - Jun. 2015
Supervisor: Prof. Xiaolin Hu
 - **Image Retrieval:** Designed a system of Neural Network training based on extracting features from raw image with descriptions. We extracted the image features using CNN and text features using word bag model. The Mean Average Precision was 91% on the dataset randomly extracted from wikipedia.
 - **Artificial Neural Network:** Implemented Multiple Layer Perceptron and Convolutional Neural Network algorithm and trained in dataset of cifar-10.

Publications:

- Junbang Liang and Ming C. Lin. *Time-Domain Parallelization for Accelerating Cloth Simulation*. Symposium on Computer Animation 2018
- Shan Yang, Junbang Liang and Ming C. Lin. *Learning-based Cloth Material Recovery from Video*. ICCV 2017
- Miao Wang, Jun-Bang Liang, Song-Hai Zhang, Shao-Ping Lu, Ariel Shamir and Shi-Min Hu. *Hyper-lapse from Multiple Spatially-overlapping Videos*. IEEE Transactions on Image Processing, 2017
- Miao Wang, Xi-Jin Zhang, Jun-Bang Liang, Song-Hai Zhang and Ralph R. Martin. *Comfort-driven Disparity Adjustment for Stereoscopic Video*. Computational Visual Media 2016

Technical Experience:

- **Software Engineering Intern, Google Inc** May. 2018 - Aug. 2018
 - Applied a reinforcement learning algorithm for dynamic work balancing in Google Cloud Services.

- Used Deep Deterministic Policy Gradient for learning and outperforms the previous algorithm by 39% in the testing dataset.
- **Software Engineering Intern, Google Inc** May. 2017 - Aug. 2017
 - Trained an attention-based OCR neural network model to extract content of interest in an image.
 - Integrated two separate neural network models to an end-to-end trainable model to detect region of interest and decode characters at the same time.
- **FTP Application** Nov. 2014
 - Developed an FTP application that can be used in all operating systems with multiple features such as resuming broken transfer, file-based user authentication and user authorization system. Several design patterns are used in the application such as Singleton and Adapter.
- **3D Rendering Using Ray Tracing** May 2014
 - Implemented Ray Tracing algorithm accelerated by K-D tree, with anti-aliasing, texture rendering and depth field focus. It could display complicated scenes such as multiple glass balls or cubes.

Competition Experience:

- **Student Cluster Competition** Nov. 2015
 - Optimized the Repast HPC Application by buffering at the bottleneck function, achieving a speedup of 10%. Visualized the output of the zombie invasion model by self-coded python and coffee scripts. Optimized the HPCG benchmark by tuning size parameters and modifying its detail implementation, the result of which reached 207 Gflops with restricted memory use and cache misses.
- **SIGMOD Contest** May. 2014
 - Competed in SIGMOD Contest 2014 as a member of Team *blalrsmb*, Tsinghua University. Solved one out of four problems using Bilateral Breadth First Search and indexing.

Competition Awards:

- **Overall Champion in Student Cluster Competition(SC15)** 2015
- **Rank 5 in SIGMOD contest** 2014
- **Rank 22 (Silver medal) in ACM/ICPC Chengdu Regional** 2013
- **Rank 7 (Gold medal) in National Olympiad in Informatics, 2011 (NOI 2011)** 2011

Scholarships:

- **Google Excellence Scholarship** 2015
 - It is awarded to only 60 undergraduate and graduate students in China every year.
- **ST Engineering China Scholarship** 2014, 2015
- **Tsinghua & Tung OOCL Scholarship** 2013
- **Tsinghua Freshman Scholarship** 2012

Programming Skills:

- Proficient in C/C++ and Python, familiar with Java, Pascal, Ruby and Javascript
- Proficient in basic data structures and algorithms. Topcoder rating is 1649. Codeforces rating is 2020.