

# FANGZHOU LIU

<https://www.cs.rochester.edu/u/fliu14/>  
243 Quinby Rd, APT B, Rochester, NY  
(+1) 585-363-8290 ◊ [fliu14@ur.rochester.edu](mailto:fliu14@ur.rochester.edu)

## EDUCATION

---

### M.S. and Ph.D in Computer Science

August 2016 - Present

Advisor: Prof. Chen Ding

University of Rochester, CGPA: 3.73/4.00

### B.E. in Telecommunication Engineering

Sept 2012 - June 2016

Beijing University of Posts and Telecommunications, CGPA: 88.1/100

## SKILLS AND INTERESTS

---

<b>Skills</b>	C/C++, Python, Swift, Java, Ruby, Mobile Apps Development(iOS), Website Development, SQL, Git, LLVM
<b>Interests</b>	Compiler-aid Optimization, Memory Locality Modeling for parallel program, Heterogeneous Memory Systems

## PUBLICATIONS

---

1. Dong Chen, Fangzhou Liu, Mingyang Jiao, Chen Ding, and Sreepathi Pai. Statistical Caching for Near Memory Management. In *Proceedings of the 5th International Symposium on Memory Systems, MEMSYS 2019*, pages 411–416, 2019
2. Hao Luo, Guoyang Chen, Fangzhou Liu, Pengcheng Li, Chen Ding, and Xipeng Shen. Footprint Modeling of Cache Associativity and Granularity. In *Proceedings of the 4th International Symposium on Memory Systems, MEMSYS 2018*, pages 234–244, 2018
3. Dong Chen, Fangzhou Liu, Chen Ding, and Sreepathi Pai. Locality Analysis Through Static Parallel Sampling. In *Proceedings of the 39th ACM SIGPLAN Conference on Programming Language Design and Implementation, PLDI 2018*, pages 557–570, 2018
4. Jacob Brock, Chen Ding, Rahman Lavaee, Fangzhou Liu, and Liang Yuan. Prediction and Bounds on Shared Cache Demand from Memory Access Interleaving. In *Proceedings of the 2018 ACM SIGPLAN International Symposium on Memory Management, ISMM 2018*, pages 96–108, 2018

## PROJECTS

---

### CARL: Program Allocation of Cache

Jan. 2019 - Present

*submitted to PLDI'20*

- Designed a compiler driven lease-cache allocation algorithm and a theoretical result to show its optimality among all lease assignment algorithms.
- Evaluation on Polybench suite shows that, compared with LRU and OPT cache replacement policy, our new policy could outperforms LRU and achieve almost the same as OPT.

### PLUM: Static Cache Performance Analysis for OpenMP program

Sep. 2018 - Present

*submitted to PPOPP'20*

- Analyzed *cache performance* for OpenMP programs during *compile time*.
- Evaluation on PolyBench suite shows that, compared with runtime instrumentation, our approach could reach 93.97% accuracy while reduce could speedup the analysis by 133.67% and 168.34% when sampling only 10% and 5% of the iteration space respectively.

## Out-of-order processor Simulation through Verilog

Oct. 2018 - Dec. 2018

*working in groups*

- Simulate a 32KB, read-only, direct-mapped instruction cache and a 32KB, 2-way set associative data cache among a working 5-stage pipeline.
- Simulate a Always-not-taken and Bimodal Branch Predictor among a working 12-stage pipeline.
- Add Renaming Module, IssueQueue, Load/Store Queue, and Retire Buffer to transfer an in-order processor to an out-of-order processor.

## Static Loop Parallelization

Feb. 2017 - May. 2017

- Develop LLVM Function pass in C++ to detect loops and generate all array access expressions.
- Implement LLVM Function pass to analyze the dependence relations, including find loop induction variables, distance vectors and direction vectors.
- Print out all loops that could be parallelized.

## INTERNSHIP/TRAINING

---

### Software Engineer Intern

May 2019 - August 2019

*ByteDance Inc. Beijing, China*

- Refactor the `TrackService` module, a module that applied to track user behavior while using the app, using Dependency Injection (`Swinject` Library) and Singleton pattern.
- Redesign and implement the `LarkLocationPicker` module using Gaode and Google Map iOS SDK. The user interaction and app behavior is binded by a FSM and implemented using reactive programming (`RxSwift` Library).
- Optimize the iOS Map SDK usage and eventually reduce nearly 56% memory consumption.
- Design and implement the *Send Location* feature within 2 weeks. This feature allows user to send and receive coordinates, and to navigate to the received destination by jumping to corresponding Map Applications through URI. It could automatically do coordinate system transformations (between WGS-84 and GCJ-02) based on user location.
- Refactor the `LarkSegmentView` UI module to make it compatible to iPad's `UISplitViewController`.

### Software Engineer Intern

June 2017 - August 2017

*Skyversed Ltd. Shenzhen, China*

- Develop the Module for `HOLLY` by OpenGL that can control(Translate, Rotate, Scale, Reset) the 3D Model.
- Implement the function that can erase points from 3D modules in selected region with given color, and undo the previous erase operation.
- Design the `PINE-Meshlab` protocol and implement it in `Meshlab` such that `Meshlab` can be opened within `PINE` control software, and transmit measuring data to `PINE` for report generation.
- Embed the 2D, 3D graphic measuring algorithm into `Meshlab` UI.

### iOS Software Engineer Intern

August 2015 - September 2015

*Xunzhi Network Technology Co., Ltd. Beijing, China*

- Develop UI for 'online chat', 'product collection' and 'user profile' view.
- Use `KVO` to solve the duplicated view display problem caused by view-reuse.
- Encapsulate product data/images in `JSON` format, and sent it to the server by using `AFNetwork` Framework.
- Resolve data from `JSON` data requested from server and displayed them on corresponding UI component.

## AWARDS

---

### SIGPLAN PAC Travel Grants for PLDI 2018

June 2018

*SIGPLAN*

### Outstanding graduates in Beijing University of Posts and Telecommunications

June 2016

*Beijing University of Posts and Telecommunications*