Hongjin Liang

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Research Interests

Programming languages, program verification, concurrency

Work Experience

- [11/2017 – present] Nanjing University. *Associate professor.*

- [07/2014 – 10/2017] University of Science and Technology of China. *Limited-term associate researcher.*

- [09/2012 – 08/2013] Yale University, New Haven, CT, USA. *Visiting assistant in research.* Advisor: Zhong Shao. Supported by China Scholarship Council.

- [Summer 2008] Microsoft Research Asia, Beijing, China. *Summer intern.* Mentor: Ming Zhou.

Education

- [09/2009 – 06/2014] Ph.D. in Computer Science, University of Science and Technology of China.
  - Thesis title: "Refinement Verification of Concurrent Programs and Its Applications".
  - Advisors: Xinyu Feng and Zhong Shao.
  - Ranked 1st in the class of 128 students, GPA: 4.02/4.3.

- [09/2005 – 06/2009] B.S. in Computer Science, University of Science and Technology of China.
  - Diploma thesis: "Inferring Loop Invariants in Pointer Logic" (in Chinese). Advisor: Yiyun Chen.
  - Graduated from *Special Class for Gifted Young*, ranked 1st of the 7 students majoring in CS, GPA: 3.92/4.3.

Honors and Awards

- Rising Stars in EECS: An Academic Career Workshop for Women, MIT, Cambridge, MA, USA, 2015 – *by invitation only*

- CCF Outstanding Doctoral Dissertation, awarded by China Computer Federation, 2015 – *the best award in China for doctoral dissertations on Computer Science*

- Outstanding Doctoral Dissertation, awarded by Chinese Academy of Sciences, 2015.

- Special Prize of President Scholarship, awarded by Chinese Academy of Sciences, 2014.

- National Scholarship for PhD students, awarded by Ministry of Education of China, 2013.

- Microsoft Research Asia PhD Fellowship, 2012.

- Google Anita Borg Scholarship, for having demonstrated superior leadership, passion for Computer Science and academic achievement, 2011.

Teaching Experience

- Courses taught

  - *The Light of Science (Young Scholars) – Programming Language Pearls* (00399570, undergraduate course), Nanjing University. Fall 2023 and Fall 2024.
  - *Formal Semantics of Programming Languages* (22011510/081200D20, undergraduate and graduate course), Nanjing University. Fall 2019, Fall 2020, Fall 2021, Fall 2022, Fall 2023 and Fall 2024.
  - *Concurrency: Algorithms and Theories* (22011590/081200D19, undergraduate and graduate course), Nanjing University. Fall 2019, Fall 2020, Fall 2021, Fall 2022 and Fall 2023.
  - *Compilers: Principles, Techniques, and Tools* (22010120, undergraduate course), Nanjing University, Fall 2018.
  - *Compiler Design and Implementation* (22011490, undergraduate course), Nanjing University, Fall 2018.
  - *Foundations of Programming Languages* (011167, undergraduate course), University of Science and Technology of China, Spring 2016.
  - *Theories of Programming Languages* (CS05115, graduate course), University of Science and Technology of China, Spring 2016.

- Teaching assistant for *Principles of Compiler* (undergraduate course), University of Science and Technology of China, Spring 2010.

Publications

Conferences

1. Rongen Lin, **Hongjin Liang** and Xinyu Feng. Verifying Algorithmic Versions of the Lovász Local Lemma. To appear in *Proceedings of 34th European Symposium on Programming (**ESOP'25**)*.

2. Weijie Fan, **Hongjin Liang**, Xinyu Feng and Hanru Jiang. A Program Logic for Concurrent Randomized Programs in the Oblivious Adversary Model. To appear in *Proceedings of 34th European Symposium on Programming (**ESOP'25**)*.

3. Xuyang Li, **Hongjin Liang** and Xinyu Feng. Verified Validation for Affine Scheduling in Polyhedral Compilation. In *Proceedings of 18th International Symposium on Theoretical Aspects of Software Engineering (**TASE'24**)*, pages 287–305, July 2024.

4. Junpeng Zha, **Hongjin Liang** and Xinyu Feng. Verifying Optimizations of Concurrent Programs in the Promising Semantics. In *Proceedings of 43rd ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI'22**)*, pages 903–917, June 2022.

5. **Hongjin Liang** and Xinyu Feng. Abstraction for Conflict-Free Replicated Data Types. In *Proceedings of 42nd ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI'21**)*, pages 636–650, June 2021.

6. Hanru Jiang, **Hongjin Liang**, Siyang Xiao, Junpeng Zha and Xinyu Feng. Towards Certified Separate Compilation for Concurrent Programs. In *Proceedings of 40th ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI'19**)*, pages 111–125, June 2019. *(Recipient of **PLDI 2019 Distinguished Paper Award**.)*

7. **Hongjin Liang** and Xinyu Feng. A Program Logic for Concurrent Objects under Fair Scheduling. In *Proceedings of 43rd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (**POPL'16**)*, pages 385–399, January 2016.

8. **Hongjin Liang**, Xinyu Feng and Zhong Shao. Compositional Verification of Termination-Preserving Refinement of Concurrent Programs. In *Proceedings of 23rd EACSL Annual Conference on Computer Science Logic and 29th Annual IEEE Symposium on Logic in Computer Science (**CSL-LICS'14**)*, Article No. 65, July 2014.

9. **Hongjin Liang**, Jan Hoffmann, Xinyu Feng and Zhong Shao. Characterizing Progress Properties of Concurrent Objects via Contextual Refinements. In *Proceedings of 24th International Conference on Concurrency Theory (**CONCUR'13**)*, pages 227–241, August 2013.

10. **Hongjin Liang** and Xinyu Feng. Modular Verification of Linearizability with Non-Fixed Linearization Points. In *Proceedings of 34th ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI'13**)*, pages 459–470, June 2013.

11. **Hongjin Liang**, Xinyu Feng and Ming Fu. A Rely-Guarantee-Based Simulation for Verifying Concurrent Program Transformations. In *Proceedings of 39th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (**POPL'12**)*, pages 455–468, January 2012.

Journals

1. **Hongjin Liang** and Xinyu Feng. Progress of Concurrent Objects. *Foundations and Trends® in Programming Languages*, Volume 5, Issue 4, pages 282-414, May 2020.

2. **Hongjin Liang** and Xinyu Feng. Progress of Concurrent Objects with Partial Methods. *Proceedings of the ACM on Programming Languages*, Volume 2, Issue **POPL**, Article No. 20, January 2018.

3. **Hongjin Liang**, Xinyu Feng and Ming Fu. Rely-Guarantee-Based Simulation for Compositional Verification of Concurrent Program Transformations. *ACM Transactions on Programming Languages and Systems (**TOPLAS**)*, Volume 36, Issue 1, Article No. 3, March 2014.

4. **Hongjin Liang**, Yu Zhang, Yiyun Chen, Zhaopeng Li and Baojian Hua. A Pointer Logic Dealing with Uncertain Equality of Pointers (in Chinese). *Journal of Software*, 21(2):334-343, February 2010.

Theses and technical reports not published elsewhere

1. **Hongjin Liang**. Refinement Verification of Concurrent Programs and Its Applications. *PhD Thesis*. May 2014.

2. **Hongjin Liang**. Inferring Loop Invariants in Pointer Logic (in Chinese). *Bachelor Thesis*. June 2009.

3. **Hongjin Liang**, Yu Zhang, Yiyun Chen and Zhaopeng Li. A Shape System and Loop Invariant Inference. *Technical Report*, University of Science and Technology of China, March 2010.

Services

- Program committee member for conferences and workshops: ESOP'25, PLDI'24, PriSC'24, OOPSLA'23, APLAS'23, PriSC'23, PaPoC'22, PLDI'22, CPP'22, POPL'22, ESOP'21, CPP'21, CPP'20, APLAS'19, POPL'19, YR-CONCUR'18, CoqPL'17, CPP'16.

- Reviewer for journals: ACM Transactions on Programming Languages and Systems (TOPLAS), Journal of Computer Science and Technology (JCST), Frontiers of Computer Science (FCS), International Journal of Foundations of Computer Science (IJFCS), Formal Aspects of Computing (FAC), Journal of Systems and Software (JSS), Journal of Logical and Algebraic Methods in Programming (JLAMP), SCIENCE CHINA Information Sciences, Journal of Software (Chinese Journal).

- Reviewer for conferences: LICS'18, FMAC'18, FoSSaCS'18, POPL'18, DISC'17, ESOP'17, iFM'16, FoSSaCS'16, ICALP'15, ICPP'15, APLAS'14, PLDI'14, CONCUR'13, ESOP'13, POPL'13, SSV'12, CONCUR'12, LICS'12, APLAS'11.