Manuel R. Torres

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Education

Aug 2017 - *Present*	University of Illinois at Urbana-Champaign Ph.D. Candidate in Theoretical Computer Science - GPA: 3.82
Jun 2014 - Jun 2017	University of California, Irvine B.S. in Computer Science; B.S. in Mathematics - GPA: 3.885

Publications

1. C. Chekuri, M. R. Torres. On the Generalized Mean Densest Subgraph Problem: Complexity and Algorithms. *Manuscript*, 2023. arXiv: https://arxiv.org/abs/2306.02172
2. C. Chekuri, K. Quanrud, M. R. Torres. Densest Subgraph: Supermodularity, Iterative Peeling, and Flow. *Proceedings of the 2022 Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2022.
3. C. Chekuri, K. Quanrud, M. R. Torres. Fast Approximation Algorithms for Bounded Degree and Crossing Spanning Tree Problems. *24th International Conference on Approximation Algorithms for Combinatorial Optimization Problems (APPROX)*, 2021. arXiv: https://arxiv.org/abs/2011.03194
4. C. Chekuri, K. Quanrud, M. R. Torres. ℓ_1-sparsity Approximation Bounds for Packing Integer Programs. *Proceedings of the 20th Integer Programming and Combinatorial Optimization (IPCO)*, 2019. arXiv: https://arxiv.org/pdf/1902.08698.pdf
5. D. Eppstein, M. T. Goodrich, J. Jorgensen, M. R. Torres. Geometric Fingerprint Recognition via Oriented Point-Set Pattern Matching. *Proceedings of the 30th Canadian Conference on Computational Geometry (CCCG)*, 2018. arXiv: https://arxiv.org/abs/1808.00561
6. D. Eppstein, M. T. Goodrich, M. Mitzenmacher, M. R. Torres. 2-3 Cuckoo Filters for Faster Triangle Listing and Set Intersection. *Proceedings of the 36th ACM SIGMOD-SIGACT-SIGAI Symposium on Principles of Database Systems (PODS)*, 2017.
7. D. Eppstein, M. T. Goodrich, J. Lam, N. Mamano, M. Mitzenmacher, and M. Torres. Models and Algorithms for Graph Watermarking. *Information Security Conference 2016 (ISC)*, 2016. arXiv: http://arxiv.org/abs/1605.09425. **(best student paper award)**
8. M. T. Goodrich, S. Gupta, M. R. Torres. A Topological Algorithm for Determining How Road Networks Evolve Over Time. *24th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*, 2016. arXiv: https://arxiv.org/abs/1609.07239.
9. M. T. Goodrich, T. Johnson, and M. Torres. Knuthian Drawings of Series-Parallel Flowcharts. *International Symposium on Graph Drawing and Network Visualization*, Springer International Publishing, 2015. arXiv: http://arxiv.org/abs/1508.03931.

Awards and Honors

Apr 2017 - *Present*	*NSF Graduate Research Fellowship Program* – This fellowship provides three years of funding, including money to cover tuition costs and a stipend of $34,000 per year

Awards and Honors (continued)

Feb 2017 - *Present*	*Sloan Scholar, Alfred P. Sloan Foundation's Minority Ph.D. (MPHD) Program* – Program for Ph.D. students who they believe will broaden participation in their respective fields, providing mentorship and resources for professional development – The scholarship provides financial support: $30,000 stipend that is dispersed throughout my time as a Ph.D. student and $10,000 to travel to conferences
Sep 2016	*Best Student Paper Award* – Awarded for the paper "Models and Algorithms for Graph Watermarking" at Information Security Conference 2016
May 2016	*Chancellor's Award for Excellence in Undergraduate Research* – Awarded for work done on Knuthian drawings of series-parallel flowcharts – Given to only one undergraduate student in the Donald Bren School of Information and Computer Sciences at UC Irvine for the year of 2016
Mar 2016	*Two-time Best Presentation in Computer Sciences/Engineering* – Awarded at 2016 and 2017 UC LEADS Symposium at UC Davis and UCLA, respectively; the first was for the Knuthian drawings research and the second for the colorful connected subgraph problem work done with Richard Karp
Apr 2015	*UC LEADS (Leadership Excellence through Advanced Degrees) Scholar* – UC LEADS is a merit-based program that helps with graduate school preparation, funds research for two summers, and provides financial help to travel to conferences – Awarded $9,000 for summer research and travel stipends for academic conferences

Select Teaching and Work Experience

Aug 2022 - Dec 2022	*Teaching Assistant (TA) for CS 498ABG, Algorithms for Big Data* – Graded all homework and exams, held weekly office hours
Sep 2021 - Dec 2021	*Applied Science Intern at Amazon* – Designed and worked towards deploying algorithms for differentially private synthetic data generation using generative modeling via machine learning methods
Aug 2020 - Dec 2020	*Teaching Assistant (TA) for CS 498ABD, Algorithms for Big Data* – Graded all homework and exams, held weekly office hours
Aug 2018 - Dec 2018	*Teaching Assistant (TA) for CS 374, Algorithms and Models of Computation* – Hosted discussion sections twice a week, graded exams, held weekly office hours
Dec 2015 - Mar 2016	*Edited discrete mathematics textbook (Zyante, Inc.)* – Helped proofread the solutions of an online discrete mathematics textbook written by Professor Sandy Irani used in the discrete mathematics course at UCI

Talks and Poster Presentations

1. Gave a talk titled "Leveraging Continuous Relaxations to Solve Densest Subgraph Problems" at the 2021 INFORMS Annual Meeting, Oct 27, 2021
2. Gave a talk on "ℓ_1-sparsity Approximation Bounds for Packing Integer Programs" at the conference for Integer Programming and Combinatorial Optimization 2019, May 24, 2019.

Talks and Poster Presentations (continued)

1. Gave a talk on "Models and Algorithms for Graph Watermarking" at Information Security Conference 2016, Sep 9, 2016, Honolulu, HI.
2. Presented a poster on the work completed with Dr. Richard Karp on the colorful connected subgraph problem at the Poster Presentation Showcase for summer research program at UC Berkeley, Aug 11, 2016, Berkeley, CA.
3. Presented a poster on "Knuthian Drawings of Series-Parallel Flowcharts" at UROP (Undergraduate Research Opportunities Program) Symposium, May 14, 2016, Irvine, CA.
4. Presented a poster on "Knuthian Drawings of Series-Parallel Flowcharts" at UC LEADS (Leadership Excellence through Advanced Degrees) Symposium, Mar 5, 2016, Davis, CA.
5. Presented a poster on "Knuthian Drawings of Series-Parallel Flowcharts" at International Symposium on Graph Drawing and Network Visualization, Sep 24, 2015, Los Angeles, CA.

Select Research Experience

Jun 2016 - Dec 2016

Colorful connected subgraph problem

- Joint work with Richard Karp of University of California, Berkeley, which was funded via my participation in the UC LEADS program
- Developed a heuristic algorithm for an NP-hard problem related to a restricted version of the group Steiner tree problem
- Dr. Karp gave a talk on the work at Princeton's Institute of Advanced Study: https://youtu.be/97xMEPBbESM

Community Involvement

Apr 2017 - Jun 2017

Student Mentor at UC Irvine Math CEO (Community Educational Outreach)

- Math CEO is an outreach program that connects underrepresented middle schools students from Santa Ana Unified School District to undergraduates from UC Irvine
- Worked on math problems and encouraged middle school students to go to college
- My duties as a mentor are to work with other mentors on helping the middle school students with math problems ranging from geometry to algebra

Aug 2015 - Apr 2017

Mentor at CAMP (California Alliance for Minority Participation)

- CAMP is an NSF-funded program at UC Irvine that aims to help students from underrepresented backgrounds in STEM attain their bachelor's degrees
- I tutor students in their work in math & computer science courses

Apr 2016

Panelist for incoming, underrepresented students

- CAMP set up a panel for incoming students to UC Irvine from underrepresented backgrounds to answer questions about how to succeed in obtaining their degrees
- I served as a panelist for students entering as computer science majors

Technical Skills

- *Programming languages:* Python, C, C++, Java, MATLAB
- *Libraries:* C++ STL, NumPy, SciPy, PyTorch
- *Data management:* SQL
- *Version control:* Git
- *Other:* proficient with LaTeX