

MITCHELL JONES

PERSONAL INFORMATION

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RESEARCH INTERESTS

Low-dimensional computational and discrete geometry. Developing approximation and randomized algorithms for problems related to partitioning, classifying, and summarizing point sets [2–4, 10]. Dynamic data structures for approximating low-dimensional proximity problems [5, 9]. Previously worked on more classical combinatorial optimization problems in graph theory [11] and bioinformatics [13].

EDUCATION

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| <i>Ph.D. in Computer Science</i> | <i>2016–Present</i> University of Illinois at Urbana-Champaign <i>Fifth year Ph.D. Candidate</i> · Degree expected August 2021 Research interests: Computational geometry, randomized & approximation algorithms, combinatorial optimization. Advisor: Sariel Har-Peled . |
| <i>Bachelor of Computer Science and Technology (Advanced)</i> | <i>2012–2015</i> University of Sydney, Australia <i>Honors Class I and Univeristy Medal</i> · GPA: 4.0 Thesis: The Maximum Facility Location Problem [17]. Advisor: Julián Mestre . |

WORK EXPERIENCE

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| <i>University of Illinois at Urbana- Champaign</i> | <i>Aug 2016–Present</i> Research assistant Research assasint, working with Sariel Har-Peled on problems in computational geometry. Developing approximation and randomized algorithms for various optimization problems in low dimensional discrete geometry [2, 4–6, 16]. |
| <i>Univerity of Illinois at Urbana- Champaign</i> | <i>Aug 2017–Dec 2019</i> Teaching assistant A teaching assistant for various courses at UIUC (see below for exact courses taught). Involves teaching weekly labs, grading, office hours, and answering student questions on Piazza. |
| <i>University of Sydney, Australia</i> | <i>August 2019</i> Visiting research assistant Visiting research assasint, working with Joachim Gudmundsson and students on various voting theory problems in computational geometry. |
| <i>University of Sydney, Australia</i> | <i>Mar 2016–Jun 2016</i> Research assistant Research assasint, worked with Julián Mestre and other faculty on developing new approaches for computing the treewidth of a graph. Led to the publication of a paper in IPEC 2016 [8], and then Algorithmica [11]. |

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|------------------------------------|-------------------|-----------------------------|---|
| University of Sydney, Australia | Jul 2013–Jun 2016 | Teaching assistant | A teaching assistant for various courses at the University of Sydney (see below for exact courses taught). Involved teaching weekly labs, grading, and answering student questions on Piazza. |
| Google, Australia | Nov 2015–Feb 2016 | Software engineering intern | A software engineering internship, worked with the social & discovery team. |
| Google, Australia | Nov 2014–Feb 2015 | Software engineering intern | A software engineering internship, worked with the Google Chrome apps team. |
| University of Sydney, Australia | Nov 2013–Mar 2014 | Summer research scholarship | Worked with Joachim Gudmundsson on various discrete and computational geometry problems over the summer of 2013–14. |

PUBLICATIONS

All papers listed below can be found at <http://mfjones2.web.engr.illinois.edu/>. The coauthors are listed *alphabetically*.

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| Conference publications | [1] | S. Har-Peled and M. Jones. <i>Some geometric applications of anti-chains</i> . <i>Canadian Conference on Computational Geometry (CCCG 2020)</i> , 1–6, 2020. |
| | [2] | S. Har-Peled, M. Jones, and S. Rahul. <i>Active learning a convex body in low dimensions</i> . <i>International Colloquium on Automata, Languages and Programming (ICALP 2020)</i> , 64:1–64:17, 2020. |
| | [3] | S. Har-Peled and M. Jones. <i>Fast algorithms for geometric consensus</i> . <i>Symposium on Computational Geometry (SoCG 2020)</i> , 50:1–50:16, 2020. |
| | [4] | S. Har-Peled and M. Jones. <i>Journey to the center of the point set</i> . <i>Symposium on Computational Geometry (SoCG 2019)</i> , To appear in <i>ACM Transactions on Algorithms (TALG)</i> . 41:1–41:14, 2019. |
| | [5] | T. M. Chan, S. Har-Peled, and M. Jones. <i>On locality-sensitive orderings and their applications</i> . <i>Innovations in Theoretical Computer Science Conference (ITCS 2019)</i> , 21:1–21:17, 2019. |
| | [6] | S. Har-Peled and M. Jones. <i>On separating points by lines</i> . <i>Symposium on Discrete Algorithms (SODA 2018)</i> , 918–932, 2018. |
| | [7] | M. Jones, J. Mestre, and B. Scholz. <i>Towards memory-optimal schedules for SDF</i> . <i>Parallel Processing Workshops (Auto-DASP 2017)</i> , 94–105, 2017. |
| | [8] | S. Gaspers, J. Gudmundsson, M. Jones, J. Mestre, and S. Rümmele. <i>Turbocharging treewidth heuristics</i> . <i>International Symposium on Parameterized and Exact Computation (IPEC 2016)</i> , 13:1–13:13, 2016. |
| Journal publications | [9] | T. M. Chan, S. Har-Peled, and M. Jones. <i>On locality-sensitive orderings and their applications</i> . <i>SIAM Journal on Computing</i> , 49(3): 583–600, 2020. |
| | [10] | S. Har-Peled and M. Jones. <i>On separating points by lines</i> . <i>Discrete & Computational Geometry</i> , 63(3): 705–730, 2020. |
| | [11] | S. Gaspers, J. Gudmundsson, M. Jones, J. Mestre, and S. Rümmele. <i>Turbocharging treewidth heuristics</i> . <i>Algorithmica</i> , 81(2): 439–475, 2019. |
| | [12] | D. M. Budden and M. Jones. <i>Cautionary tales of inapproximability</i> . <i>Journal of Computational Biology</i> , 24(3): 213–216, 2017. |
| | [13] | S. Canzar, K. M. Elbassioni, M. Jones, and J. Mestre. <i>Resolving conflicting predictions from multimaping reads</i> . <i>Journal of Computational Biology</i> , 23(3): 203–217, 2016. |
| Current submissions & manuscripts | [14] | S. Har-Peled and M. Jones. <i>Stabbing convex bodies with lines and flats</i> . Submitted. 2020. |
| | [15] | M. Jones. <i>Cutting cycles of rods in space is FPT</i> . 2020. |

- [16] S. Har-Peled and M. Jones. *Few cuts meet many point sets*. Submitted. 2018.
- [17] M. Jones. *The maximum facility location problem*. Undergraduate honors thesis, University of Sydney. 2015.

TALKS

All listed talks below link to a PDF of the slides used (unless it was a whiteboard talk). Conference talks are typically twenty minutes, seminar talks are at least forty minutes.

Conference & workshop talks

August 2020 · [Some geometric applications of anti-chains](#) [1], Canadian Conference on Computational Geometry (CCCG 2020), Online (due to COVID-19). Talk is also [available on YouTube](#).

July 2020 · [Active learning a convex body in low dimensions](#) [2], International Colloquium on Automata, Languages and Programming (ICALP 2020), Online (due to COVID-19). Talk is also [available on YouTube](#).

June 2020 · [Fast algorithms for geometric consensus](#) [3], Symposium on Computational Geometry (SoCG 2020), Online (due to COVID-19). Talk is also [available on YouTube](#).

Nov 2019 · [Journey to the center of the point set](#) [4], 70th Midwest Theory Day (MTD) at IIT, Chicago, IL, USA.

June 2019 · [Journey to the center of the point set](#) [4], Symposium on Computational Geometry (SoCG 2019), Portland, Oregon, USA.

June 2019 · [Active learning a convex body in low dimensions](#) [2], Young Researchers Forum (YRF), Symposium on Computational Geometry (SoCG 2019), Portland, Oregon, USA.

Jan 2019 · [On locality-sensitive orderings and their applications](#) [5], Innovations in Theoretical Computer Science (ITCS 2019), San Diego, California, USA.

Jan 2018 · [On separating points by lines](#) [6], Symposium on Discrete Algorithms (SODA 2018), New Orleans, Louisiana, USA.

Seminar talks

Nov 2019 · [Active learning a convex body in low dimensions](#) [2], UIUC Theory CS Seminar, Illinois, USA.

Aug 2019 · [On locality-sensitive orderings and their applications](#) [5], Sydney algorithms group, New South Wales, Australia.

Sep 2018 · [On locality-sensitive orderings and their applications](#) [5], UIUC theory CS seminar, Illinois, USA.

Sep 2017 · [On separating points by lines](#) [6], UIUC theory CS seminar, Illinois, USA.

Oct 2016 · [Turbocharging treewidth heuristics](#) [8, 11], UIUC theory CS seminar, Illinois, USA.

Oct 2015 · [The maximum facility location problem](#) [13, 17], Sydney algorithms group, New South Wales, Australia.

TEACHING

*University of
Illinois at Urbana-
Champaign*

Fall 2019 · TA · CS473, Algorithms
Spr 2019 · Head TA · CS374, Intro to Algorithms & Models of Computation (+)
Fall 2017 · TA · CS473, Algorithms

(+): For that semester, ranked as an **excellent teacher by students**. Lists compiled by the **University of Illinois Center for Innovation in Teaching & Learning**.

*University of
Sydney, Australia*

2016 · TA · COMP2022, Formal Languages & Logic
2015 · Head TA · COMP2007/2907, Algorithms & Complexity
2015 · TA · COMP2022, Formal Languages & Logic
2014 · TA · COMP2007/2907, Algorithms & Complexity
2014 · TA · COMP2022, Formal Languages & Logic
2014 · TA · INFO2120, Database Systems I
2013 · TA · INFO1105, Data Structures

EDITORIAL SERVICES

External Reviewer

Symposium on Discrete Algorithms (SODA): 2019, 2021
International Colloquium on Automata, Languages and Programming (ICALP): 2020
Foundations of Software Technology and Theoretical Computer Science (FSTTCS): 2018

Referee

Algorithmica (ALGO)

OUTREACH

2017–2020 CS Grad Ambassador

The role of a CS graduate ambassador is to connect with incoming graduate students. For example, meeting with them on visit days and answering any questions they have about the grad program or life at UIUC.

2015–2016 Zero Robotics mentor

For two years, I was a mentor for the **Zero Robotics** programming competition, when it was initially being piloted in Australia from September to December 2015. Each mentor was assigned a high school, where students would form a team and learn the necessary programming skills in order to control robots known as SPHERES. As a mentor, I visited a high school each week to help and teach the team of students the required programming, math, and physics in order to participate in the competition.

2012–2015 NCSS Challenge tutor

The **NCSS challenge** is a yearly programming competition for students in Australia and New Zealand. Students ranging from Years 7–12 are able to enter the Python programming competition. New problem sets are released each week, along with a set of notes explaining new concepts which help them solve the weekly problems. As a tutor, my responsibility was regularly helping students with any programming questions on an online forum.

2014

NCSS Summer school tutor

Every year, the **NCSS summer school** is a ten day summer school for students in Years 11 and 12. The school brings together talented high school students from Australia and New Zealand to participate in an intensive programming course. Each year, students learn the Python programming language and many other technologies such as HTML, CSS, JavaScript, and SQL. Throughout the period, students attend labs run by the tutors, and at the end form teams to build a final project (e.g., design and develop a new social networking site). As a tutor, my role was to run labs, help students with any programming questions, and **organize fun activities** for the students to enjoy.

ACHIEVEMENTS & AWARDS

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| 2019 | Mavis Future Faculty Fellow award (MF3) |
| 2015 | The Allan Bromley Prize for best honours thesis Award for first place in Advanced Data Models (COMP5338) Award for first place in Computational Geometry (COMP5045) University of Sydney Academic Merit Prize Dean's List of Excellence in Academic Performance University of Sydney, School of IT's High Honour Roll |
| 2014 | Award for first place in Discrete Optimisation (COMP3530) University of Sydney Academic Merit Prize Dean's List of Excellence in Academic Performance University of Sydney, School of IT's High Honour Roll |
| 2013 | HEDLOC Undergraduate Prize for Algorithms University of Sydney Academic Merit Prize Dean's List of Excellence in Academic Performance University of Sydney, School of IT's High Honour Roll |

COMPUTER SKILLS

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| <i>Primary languages</i> | C++, PYTHON, JAVA, L ^A T _E X. |
| <i>Experience with</i> | HTML/CSS, JAVASCRIPT, SQL, MARKDOWN, GIT, CGAL . |
| <i>Previous experience with</i> | PHP, C, C#. Also previous experience with many other web technologies, including DJANGO, RUBY ON RAILS, MONGODB, NEO4J, JQUERY, and BOOTSTRAP. |

Last updated: October 23, 2020