

# JAMES (JAMIE) T. MORTON

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## EDUCATION

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<b>Graduate</b> 2015 - Present	University of California, San Diego PhD student in Computer Science Expected Graduation Date: August 2018
<b>Graduate</b> 2014 - 2015	University of Colorado, Boulder PhD student in Computer Science Integrative Quantitative Biology Program
<b>Undergraduate</b> 2010 - 2014	Miami University, Oxford, OH B.S. Computer Science (Cum Laude) B.S. Electrical Engineering (Cum Laude) B.S. Mathematics and Statistics B.S. Engineering Physics
<b>Study Abroad</b> Spring 2012	Hong Kong University of Science and Technology

## HONORS

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- **NSF Graduate Fellow**, 2014 - present
- **Integrated Quantitative Biology Fellowship**, University of Colorado Boulder, 2014 - 2015
- **National Barry Goldwater Scholar**, 2013
- **Benjamin Harrison Scholar**, Miami University, 2010-2014
- **First place**, Institute of Navigation (ION) Autonomous Snowplow Competition, 2014
- **NSF REU**, Cold Spring Harbor Laboratories, Summer 2012
- **Provost Academic Achievement Award**, Miami University, 2012
- **Ohio Space Grant Scholar Award**, NASA, 2012 - 2014
- **Dean's List**, Miami University, 2010-13
- **R.L. Edwards Scholarship**, Department of Physics, Miami University, 2011, 2013
- **Mary Jeannette and Clifford Harvey Scholarship**, Department of Mathematics, Miami U., 2013
- **Mary Jean and Joseph R. Priest Scholarship**, Department of Physics, Miami University, 2012
- **President List**, Miami University, 2010-11
- **Nestle Scholar**, Computer Sci. and Software Eng. Dept, Miami University, 2011
- **Faculty Prize**, Department of Mathematics, Miami University, 2011
- **Joseph A. Culler Award**, Department of Physics, Miami University, 2010, 2011
- **NSF Travel Grant**, Coupling, Energetics, & Dynamics of Atmospheric Regions workshop, 2010
- **Wright Scholar**, Air Force Research Laboratory, Wright Patterson Air Force Base, 2009

## RESEARCH INTERESTS

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High dimensional statistics, compositional data analysis, and machine learning techniques with applications to microbial ecology with special interests in multi-omics data fusion and functional genomics.

## PUBLICATIONS

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1. Washburne, A., **Morton, James T**, Sanders, J., McDonald, D., Zhu, Q., Oliverio, AM, and Knight, R. (2017). Phylogenetic analysis of microbiome data: making sense of microbiomes in light of evolution
2. McCall, L.-I., **Morton, James T**, Bernatchez, J. A., de Siqueira-Neto, J. L., Knight, R., C., D. P., and McKerrow, J. H. (2017). Molecular cartography of experimental cardiac infection by the parasite *trypanosoma cruzi*

3. Consortium, E. M. P. The earth microbiome project
4. Impacts of the human gut microbiome on therapeutics
5. Metcalf, J. L., Song, S. J., Morton, J. T., Weiss, S., Seguin-Orlando, A., Joly, F., Feh, C., Taberlet, P., Coissac, E., Amir, A., Willerslev, E., Knight, R., McKenzie, V., and Orlando, L. (2017). Domestication and captivity shape the horse gut microbiome
6. **Morton, James T**, Sanders, J., Quinn, R. A., McDonald, D., Gonzalez, A., Vázquez-Baeza, Y., Navas-Molina, J. A., Song, S. J., Metcalf, J. L., Hyde, E. R., et al. (2017a). Balance trees reveal microbial niche differentiation. *mSystems*, 2(1):e00162–16
7. **Morton, James T**, Toran, L., Edlund, A., Metcalf, J. L., Lauber, C., and Knight, R. (2017b). Uncovering the horseshoe effect in microbial analyses. *mSystems*, 2(1):e00166–16
8. Amir, A., McDonald, D., Navas-Molina, J. A., Debelius, J., **Morton, James T**, Hyde, E., Robbins-Pianka, A., and Knight, R. (2017a). Correcting for microbial blooms in fecal samples during room-temperature shipping. *mSystems*, 2(2):e00199–16
9. Amir, A., McDonald, D., Navas-Molina, J. A., Kopylova, E., **Morton, James T**, Xu, Z. Z., Kightley, E. P., Thompson, L. R., Hyde, E. R., Gonzalez, A., et al. (2017b). Deblur rapidly resolves single-nucleotide community sequence patterns. *mSystems*, 2(2):e00191–16
10. Vázquez-Baeza, Y., Gonzalez, A., Smarr, L., McDonald, D., **Morton, James T**, Navas-Molina, J. A., and Knight, R. (2017). Bringing the dynamic microbiome to life with animations. *Cell Host & Microbe*, 21(1):7–10
11. Vrbanc, A., Debelius, J. W., Jiang, L., Morton, J. T., Dorrestein, P., and Knight, R. (2017a). An elegans (t) screen for drug-microbe interactions. *Cell Host & Microbe*, 21(5):555–556
12. Hill-Burns, E. M., Debelius, J. W., Morton, J. T., Wissemann, W. T., Lewis, M. R., Wallen, Z. D., Peddada, S. D., Factor, S. A., Molho, E., Zabetian, C. P., Knight, R., and Payami, H. (2017). Parkinson’s disease and parkinson’s disease medications have distinct signatures of the gut microbiome. *Movement Disorders*, 32(5):739–749
13. Hemmings, S. M., Malan-Muller, S., van den Heuvel, L. L., Demmitt, B. A., Stanislawski, M. A., Smith, D. G., Bohr, A. D., Stamper, C. E., Hyde, E. R., Morton, J. T., et al. (2017). The microbiome in posttraumatic stress disorder and trauma-exposed controls: An exploratory study. *Psychosomatic Medicine*
14. Reber, S. O., Siebler, P. H., Donner, N. C., Morton, J. T., Smith, D. G., Kopelman, J. M., Lowe, K. R., Wheeler, K. J., Fox, J. H., Hassell, J. E., et al. (2016). Immunization with a heat-killed preparation of the environmental bacterium mycobacterium vaccae promotes stress resilience in mice. *Proceedings of the National Academy of Sciences*, page 201600324
15. Gilbert, J. A., Quinn, R. A., Debelius, J., Xu, Z. Z., Morton, J., Garg, N., Jansson, J. K., Dorrestein, P. C., and Knight, R. (2016). Microbiome-wide association studies link dynamic microbial consortia to disease. *Nature*, 535(7610):94–103
16. Nellore, A., Collado-Torres, L., Jaffe, A. E., Alquicira-Hernández, J., Wilks, C., Pritt, J., **Morton, James**, Leek, J. T., and Langmead, B. (2016). Rail-rna: Scalable analysis of rna-seq splicing and coverage. *Bioinformatics*, page btw575
17. Petras, D., Nothias, L.-F., Quinn, R. A., Alexandrov, T., Bandeira, N., Bouslimani, A., Castro-Falcon, G., Chen, L., Dang, T., Floros, D. J., et al. (2016). Mass spectrometry-based visualization of molecules associated with human habitats. *Analytical Chemistry*, 88(22):10775–10784
18. Barberán, A., Dunn, R. R., Reich, B. J., Pacifici, K., Laber, E. B., Menninger, H. L., Morton, J. T., Henley, J. B., Leff, J. W., Miller, S. L., and Fierer, N. (2015). The ecology of microscopic life

- in household dust. *Proceedings of the Royal Society of London B: Biological Sciences*, 282(1814)
19. **Morton, James T**, Freed, S. D., Lee, S. W., and Friedberg, I. (2015). A large scale prediction of bacteriocin gene blocks suggests a wide functional spectrum for bacteriocins. *BMC bioinformatics*, 16(1):381
  20. **Morton, James T**, Abrudan, P., Figueroa, N., Liang, C., and Karro, J. E. (2014). Scope++: Sequence classification of homopolymer emissions. *Genomics*, 104(3):157–162
  21. Vrbanc, A., Taylor, B. C., Aksenov, A., Callewaert, C., Debelius, J., Gonzalez, A., McCall, L.-I., McDonald, D., Melnik, A. V., **Morton, James T.**, Navas, J., Quinn, R., Sanders, J. G., Swafford, A. D., Thompson, L. R., Tripathi, A., Vazquez-Baeza, Y., Xu, Z. Z., Zaneveld, J., Zhu, Q., Caporaso, J. G., C., D. P., and Knight, R. (2017b). Best practices for analyzing microbiomes
  22. Consortium, T. A. G. P. (2017). The american gut project
  23. Quinn, R. A., Comstock, W., Zhang, T., **Morton, James T.**, Silva, R. d., Tran, A., Aksenov, A., Nothias-Scaglia1, L.-F., Wangpraseurt, D., Melnik, A. V., Ackerman, G., Conrad, D., Klapper, I., Knight, R., and Dorrestein, P. C. (2017). Niche partitioning of a polymicrobial infection driven by chemical gradients
  24. (2017). 3d chemical tracking of a human habitat and its human and microbial occupants
  25. Martino, C., **Morton, James T.**, Knight, R., and Zengler, K. (2017). Extrapolations across the vast unobserved microbial space with matrix completion
  26. Lavrinienko, A., Mappes, T., Tukalenko, E., Mousseau, T. A., Mller, A. P., Knight, R., **Morton, James T.**, Thompson, L. R., and Watts, P. C. (2017). Environmental radiation alters the gut microbiome of the bank vole *Myodes glareolus*

## PRESENTATIONS

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- Morton et al. The Microbiome and Sex Differences. Sex and the Kidneys: Sex Differences in Renal Disease Workshop in Bethesda, MD (2017)
- Morton et al. Balances Reveal Microbial Niche Differentiation. CODAwork (2017)
- Morton et al. From Probabilities to Balances: An Alternative Approach. Information Theory and Applications Workshop (2016)
- Morton et al. From Probabilities to Balances: An Alternative Approach Random Processes and Time Series: Theory and Applications (2016)
- Reber et al. An immunization strategy for prevention of post-traumatic stress disorder (PTSD) promotes stress resilience in mice. University California San Diego Pediatrics Symposium (2016)
- Reber et al. Immunization with a heat-killed preparation of the environmental bacterium *Mycobacterium vaccae* promotes stress resilience in mice. DNA Day (2015)
- Morton, J., Lladser M., Knight R., Uncovering the Unknown: A New Approach in Analyzing Microbiome Data NSF Data Science Workshop, 2015
- Morton, J., Freed, S. Lee, S. Friedberg, I. Prediction of Bacteriocin Associated Operons Rocky Mountain Bioinformatics Conference, 2014
- Morton, J., Freed, S. Lee, S. Friedberg, I. A pipeline for Identifying Bacteriocin-Associated Gene Clusters. ISMB Boston, 2014
- Morton, J., Freed, S. Lee, S. Friedberg, I. Discovering the Next Antibiotic Ohio Space Grant Consortium, Cleveland OH, 2014

- Morton, J., P., Abrudan, J. Karro, C. Liang , Sequence classification of homopolymer emissions (SCOPE), Great Lakes Bioinformatics Conference, Pittsburgh, PA, 2013
- Morton, J., P., Abrudan, J. Karro, C. Liang , Sequence classification of homopolymer emissions (SCOPE), Ohio Space Grant Consortium, Cleveland OH, 2013
- Morton, J., P., Abrudan, J. Karro, C. Liang , Sequence classification of homopolymer emissions (SCOPE), IEEE 2nd International Conference on Computational Advances in Bio and Medical Sciences, ICCABS 2012, Las Vegas, NV, February 2012
- Morton, J., J. Karro, C. Liang, A novel approach for identifying poly(A) tails in raw cDNA sequence data using General Hidden Markov Models, Genome Informatics Cold Spring Harbor, NY, November 2011.

## PROFESSIONAL MEMBERSHIPS AND SERVICES

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- Poster Reviewer for ISMB 2015 2014-2016
- International Society of Computational Biology Student member, Summer 2014-Present
- Sigma Pi Sigma, Tau Beta Pi, Eta Kappa Nu Spring 2014-2014
- National Society of Collegiate Scholars, Fall 2012 - Spring 2013
- Association for Computing Machinery Student member, Fall 2011-2014
- Institute of Electrical and Electronics Engineers Student member, Fall 2011-2016
- IEEE Miami Student Chapter Treasurer, Fall 2011- Spring 2012

## WORKSHOPS

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- Instructor. Qiime2 workshop. UBC Vancouver August 23-25, 2017
- Instructor. Qiime2 workshop. UBC Kelowna August 21-22, 2017
- Teaching Assistant. Qiime2 workshop. Las Vegas June 21-23, 2017
- Teaching Assistant. STAMPS Woodshole, MA, August 2-13 2016

## STUDENT MENTORING

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During my studies as a PhD students, I have mentored and co-authored with the following students.

- Jue Wang (undergraduate student Summer 2017)
- Cameron Martino (undergraduate student Spring 2017)
- Liam Toran (masters student Summer 2016)
- Kayla Orlinsky (undergraduate student Spring 2016)

## SKILLS

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### Foreign Language Skills

- Chinese – Working Proficiency in Mandarin and written Chinese

### Technical Skills

- Python   • C/C++   • Java   • Javascript   • L<sup>A</sup>T<sub>E</sub>X   • ROS   • Hadoop
- Matlab   • R   • Unix   • SQL   • OpenCL   • CUDA   • git

## OPEN SOURCE CONTRIBUTIONS

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- Gneiss (Core Maintainer)
- Sci-kit Bio (Developer)
- Emperor (Developer)
- Qiime2 (Contributor)
- Deblur (Contributor)
- Micronota (Developer)
- BOA: Bacteriocin Operon Associator (Lead Developer)
- SCOPE++: Sequence Classification Of homoPolymer Emissions (Lead Developer)
- Rail-RNA (Contributor)
- Scipy (Contributor)
- Biopython (Contributor)