layout: cv

title: Daniel McKenzie's CV

Daniel McKenzie

Applied Math and ML.

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Positions

`2019-present` **University of California, Los Angeles**. Assistant Adjunct Professor (i.e. postdoc).

Research interests

Machine Learning, Signal Processing and Optimization. More specifically; zeroth-order optimization and applications, data-driven metrics on high-dimensional point clouds and implicit depth neural networks.

Education

`2013-2019` **University of Georgia, USA.** PhD. Advisor: Ming-Jun Lai. Dissertation title: *Efficient graph clustering algorithms using compressive sensing*

`03/2013-06/2013` **University of Bayreuth, Germany.** Short term visitor. Host: Fabrizio Catanese

`2011-2013`
University of Cape Town, South Africa. M.Sc *(with distinction)*.
Advisors: Ken Hughes, Rob Martin.
Thesis title: On uniformization of compact Kahler manifolds with negative first Chern class by bounded symmetric domains.

`2007-2010`
University of Cape Town, South Africa. B.Sc *(with distinction)*

Awards

`2021` Liggett Instructor Award.

`2019` William Armor Wills Memorial Scholarship.

`2017` University Outstanding Teaching Assistant Award.

`2014-2016` NRF Doctoral Scholarship for Study Abroad.

`2013` DAAD Short Term Research Exchange *(to University of Bayreuth)*.

`2012` DAAD-NRF Joint Masters Bursary.

`2010` UCT Council Merit Scholarship.

`2010` NRF Honours Bursary.

`2009` Jakob Burlak Memorial Trust Scholarship.

`2007,2008,2009` UCT Science Faculty Scholarship.

Publications

A list is also available online. *= undergraduate coauthor.

Journals

`2021` *Balancing geometry and density: Path distances on high-dimensional data.* SIMODS (to appear.) With Anna Little and James M. Murphy

`2020` *Compressive sensing for cut improvement and local clustering.* SIMODS. With Ming-Jun Lai.

`2019` *Power weighted shortest paths for clustering Euclidean data.* Foundations of Data Science. With Steve Damelin

Conferences

`2021` *A zeroth-order, block coordinate descent algorithm for huge-scale black-box optimization.* ICML. With HanQin Cai, Yuchen Lou* and Wotao Yin.

`2020` *Who killed Lilly Kane? A case study in applying knowledge graphs to crime fiction.* IEEE Big Data GTA3 Workshop. With Mariam Alaverdian*, William Gilroy*, Veronica Kirgios*, Xia Li, Carolina Matuk*, P. Jeffrey Brantingham and Andrea Bertozzi.

Submitted

`2021` *Curvature-Aware Derivative-Free Optimization* With Bumsu Kim, HanQin Cai and Wotao Yin.

`2021` *Learn to predict equilibria via Fixed Point Networks.* With Howard Heaton, Qiuwei Li, Samy Wu Fung, Stanley Osher and Wotao Yin.

`2021` *Fixed Point Networks: Implicit depth models with Jacobian-free backprop.* With Samy Wu Fung, Howard Heaton, Qiuwei Li, Stanley Osher and Wotao Yin.

`2020` *Zeroth-order regularized optimization (ZORO): Approximately sparse gradients and adaptive sampling.* With HanQin Cai, Wotao Yin and Zhenliang Zhang.

`2020` *A one-bit, comparison-based gradient estimator.* With HanQin Cai, Wotao Yin and Zhenliang Zhang.

Talks

All talks invited unless otherwise stated.

`10/2021` **INFORMS2021: Recent Advances in Derivative-free Optimization**. Anaheim, CA.

`08/2021` **Mathematics of Machine Learning**. Online. *(contributed)*

`07/2021` **SIAM OP21: Optimization, Data Science and their Applications**. Online.

`06/2021` **Optimal Transport and Mean Field Games Seminar**. Online.

`11/2020` **INFORMS2020: Session on Recent Progress in Blackbox Optimization**. (online).

`04/2020` **Tufts Math of Data Science Lecture Series**. Online.

`02/2020` **UGA Applied Math Seminar**. Athens, GA.

`09/2019` **SIAM South-Eastern Sectional**. Knoxville, TN.

`05/2018` **International Conference on Computational Harmonic Analysis (ICCHA7)**. Nashville, TN. *(contributed)*

`10/2018` **AMS Central Sectional**. Ann Arbor, MI.

Teaching

`2021` **Math 151BH.** Honors Applied Numerical Methods II, UCLA. *(I also co-developed this course).*

`2021` **Math 151AH.** Honors Applied Numerical Methods I, UCLA. *(I also co-developed this course).*

`2020–present` **Math 118.** Mathematical Methods of Data Theory, UCLA. *(taught three times. I also co-developed this course).*

`2020` **Math 170S.** Statistics, UCLA.

`2019` **Math 151A.** Applied Numerical Methods, UCLA.

`2019` **Math 32A.** Calculus III, UCLA.

`2015–2019` **Math2250.** Calculus I, UGA. *(taught three times).*

`2014–2018` **Math1113.** Precalculus, UGA. *(taught six times).*

Service

Organization

`2021` **Exploiting structure in zeroth-order optimization.** Workshop at INFORMS2021.

`2020` **ZOOM: Zeroth Order Online Meeting.** (Online) mini-conference.

Undergrad. Students Mentored

`2021` Yuchen Lou (Hong Kong Univ. --> Northwestern Univ.), Isha Slavin (UCLA), Allen Zou (UCSD).

`2020` Mariam Alaverdian (Los Angeles Community College --> Yale), William Gilroy (Harvey Mudd), Veronica Kirgios (Notre Dame), Carolina Matuk (Univ. Iowa), Charles Stoksik (UCLA), Chenglin Yang (UCLA --> Columbia), Allen Zou (UCSD).

`2018` Lucas Connell (UGA).

Outreach

`2011–2012` [SHAWCO](#). I tutored students, trained volunteers and co-led the KenSMART project.

Graduate Students Mentored

`2019–present` Howard Heaton, Bumsu Kim.

Skills

Proficient in Python (specifically: NumPy, SciKitLearn and PyTorch), Matlab, LaTeX and Markdown.