

Stephan D. Patterson

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Education

Ph.D. in Applied Mathematics (Expected 2020)

University of Colorado Denver, Denver, CO.

Advisor: Steffen Borgwardt

Title: Algorithms for Discrete Barycenters

M.S. in Applied Mathematics (2014) Emphasis: Numerical Analysis

University of Colorado Denver, Denver, CO.

Equivalent of Bachelors in Mathematics with Computer Science Minor (2012)

University of Colorado Denver, Denver, CO.

B.M. in Music Education (2006) Mathematics Minor

Anderson University, Anderson, IN.

Teaching Experience

Aug. '11 - present *University of Colorado Denver*

Instructor with Full Course Responsibility:

MATH 3191 Applied Linear Algebra (Fall '19)

MATH 3000 Introduction to Abstract Mathematics (Spring '18)

MATH 3200 Differential Equations (Spring '17, Fall '17)

MATH 2411 Calculus II (Spring '15, Fall '15, '16, '18)

MATH 1401 Calculus I (Fall '14, Summer '14, '17, '18)

MATH 1070 Algebra for Social Sciences & Business (Fall '12)

Other:

Review Facilitator: MATH 5070 Real Analysis (Summer '16)

Grader: MATH 3191 Linear Algebra (Spring '19), MATH 2830

Introductory Statistics (Spring, Fall '19), MATH 2421

Calculus III (Fall '11)

Tutor: Zenas Hartvigson Memorial Math Education Resource
Center (Fall '11, Spring '12)

Aug. '08 - May '12 *Tutor.com*

Calculus Tutor, Math Mentor

Oct. '06 - May '08 *Substitute Teacher in Local Public Schools*

Publications

Steffen Borgwardt and Stephan Patterson. *Improved Linear Programs for Discrete Barycenters*. INFORMS Journal on Optimization, 2019.

Steffen Borgwardt and Stephan Patterson. *A Column Generation Approach to the Discrete Barycenter Problem*. Submitted 2019.

Steffen Borgwardt and Stephan Patterson. *On the Computational Complexity of Finding a Sparse Wasserstein Barycenter*. Submitted 2019.

Research Interests

Efficient Computations and Complexity Theory, Optimization and Optimal Transport Problems, Numerical Analysis, Statistical Models

Professional and Community Service

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|---------------------|--|
| Aug. '12 - Present | UCDenver Department of Mathematical & Statistical Sciences <ul style="list-style-type: none">• Mentor for Graduate Teaching Assistants (Aug. '15-Present)• CLAS Dean's Advisory Board Member (Aug. '15-May '16)• Volunteer, including as session chair, at Front Range Applied Mathematics Student Conference (Annual)• Volunteer tutor for undergraduate final exams review (Fall/Spring Semesters)• Volunteer panel member for Department Graduate Orientation• Mentor for a public school teacher preparing to teach Differential Equations (Aug.- Dec. '16) |
| Aug. '02 - Jan. '10 | Various service and volunteer activities with preschool through college students, including <ul style="list-style-type: none">• Weekly group music classes for homeschooled students ('04)• Special Olympics track coach ('05)• Chaperone for middle school trips ('06-'08) |

Presentations

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| Mar. '18 | <i>INFORMS Optimization Society Conference 2018</i>
A Divide-and-Conquer Algorithm for Discrete Barycenters |
| Feb. '18 | <i>Front Range Applied Math Student Conference</i>
A Divide-and-Conquer Algorithm for Discrete Barycenters |

Awards

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| Spring '16 | <i>Lynn Bateman Memorial Fellowship</i>
Awarded for Excellence in Teaching |
| Spring '06 | <i>Honors in Music</i>
<i>Honors in Education</i> |

Computer Skills

C++, MATLAB/Octave, R, Python, OpenCL, Mathematica, Latex, OSX, Windows, Linux

Research Assistantships

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| Aug. '13 - May '14 | <i>Research Assistant to Prof. Julien Langou: NSF DMS 1115723</i>
Statistical error analysis in communication-avoiding algorithms
New communication-avoiding reordering Schur form algorithm |
| Jan. '13 - Jul. '13 | <i>Research Assistant to Prof. Julien Langou: NSF 1032861</i> |
| Jun. '12 - Aug. '12 | Rewrote LAPACK solver routines in C++ |