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Davis Rempe

INTERESTS Computer Graphics, Physically-Based Simulation/Animation, Computer Vision, Machine Learning

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EDUCATION

Stanford University, Stanford, CA

Ph.D. in Computer Science

September, 2017 – Present

- Selected Coursework: Machine Learning (CS229), Computer Vision (CS231a, Winter 2018)

University of Nebraska (UNL), Lincoln, NE

B.S. in Computer Science and Mathematics (Minor: Physics) with Highest Distinction

August, 2012 – December, 2016

- Thesis: Effectiveness of Global, Low-Degree Polynomial Transformations for GC x GC Data Alignment
- Selected Coursework: Numerical Analysis, Numerical Linear Algebra, Intro to Partial Differential Equations, Computer Graphics, Introduction to Data Mining, Digital Motion Graphics, Digital Visual Effects, Digital Animation.

RESEARCH EXPERIENCE

Rotating Research Assistant, Stanford University

September, 2017 – Present

- Fall quarter: improving cloth simulation via machine learning (under Dr. Ron Fedkiw)
- Winter quarter: physical simulation and animation (under Dr. Doug James)

Research and Development Intern, GC Image, Lincoln, NE

August, 2016 – July, 2017

- Algorithms for peak detection and deconvolution in gas chromatography data.

Smart Spaces REU Site Research Intern advised by Dr. Brian Chen, Lehigh University

May, 2016 – July, 2016

- Inexpensive augmented reality for 3D bone model visualization during surgery.

Undergraduate Researcher advised by Dr. Stephen Reichenbach, UNL

June, 2015 – May, 2016

- Data alignment algorithms for comprehensive two-dimensional gas chromatography.

Undergraduate Researcher advised by Dr. Aaron Dominguez, UNL High Energy Physics

January, 2013 – May, 2014

- Characterization and construction of particle detectors.

Undergraduate Researcher advised by Dr. Timothy Gay, UNL Polarized Electron Physics
June, 2012 – September, 2012

- Researched and refurbished vacuum pump system. Polarized light optics project.

JOURNAL PUBLICATIONS

- **D. Rempe**, S. Reichenbach, Q. Tao, C. Cordero, C. A. Zini, *Effectiveness of Global, Low-Degree Polynomial Transformations for GC x GC Data Alignment*, Analytical Chemistry, *88*(20), pp. 10028-10035, 2016.
- S. Reichenbach, **D. Rempe**, Q. Tao, D. Bressanello, E. Liberto, C. Bicchi, S. Balducci, and C. Cordero, *Alignment for Comprehensive Two-Dimensional Gas Chromatography with Dual Secondary Columns and Detectors*, Analytical Chemistry, *87*(19), pp. 10056-10063, 2015.

CONFERENCE PUBLICATIONS

- **D. Rempe**, M. Snyder, A. Pracht, T. Nguyen, M. Vostrez, Z. Zhao, and M.C. Vuran. *A Cognitive Radio TV Prototype for Effective TV Spectrum Sharing*, 2017 IEEE International Symposium on Dynamic Spectrum Access Network (DySPAN), Baltimore, MD, USA, March 6-9, 2017.
- S. Reichenbach, **D. Rempe**, Q. Tao, C. Cordero, *Simple models for second-column retention-time variability across peaks from GCxGC*, 8th Multidimensional Chromatography Workshop, Toronto, ON, Canada, January 5-6, 2017.
- **D. Rempe**, S. Reichenbach, and S. Scott, *Alignment for Comprehensive Two-Dimensional Gas Chromatography (GCxGC) with Global, Low-Order Polynomial Transformations*, UNL Spring Research Fair Poster Session, Lincoln, NE, USA, April, 2016.

ACHIEVEMENTS AND AWARDS

Lehigh Smart Spaces REU Site Outstanding Project (2016)
Chosen by a faculty panel at culmination of summer REU.
Undergraduate Creative Activities and Research Experience (UCARE)
2015 – 2016: Funding for individual computer science research for the academic year.
2013 – 2014**:** Funding for group physics research for the academic year.
Eunice Stout Scholarship (2016)
D & F Eastman Scholarship (2013 – 2016)
Regents Scholarship (2012 – 2016)
Honors Program Book Scholarship (2012 – 2016)
Hixon-Lied College of Fine and Performing Arts Dean's List
Spring/Fall 2013, Spring/Fall 2014, Spring/Fall 2015, Spring 2016
College of Arts and Sciences Dean's List
Fall 2012, Spring/Fall 2013, Spring/Fall 2014, Spring/Fall 2015, Spring/Fall 2016
UNL High Scholar
2013, 2014, 2015, 2016
College of Arts and Sciences Celebration of Excellence for Academic Achievement
Spring 2013

PROFESSIONAL EXPERIENCE

Software Development Intern, GC Image, Lincoln, NE

August, 2014 – August, 2015

- Worked on scientific software for visualizing and analyzing comprehensive two-dimensional gas and liquid chromatography data. Required programming (largely in Java), software development, software testing, and technical documentation.

TEACHING EXPERIENCE

Teaching Assistant for CSCE 310H – Honors Data Structures and Algorithms

Spring 2016

Coding Seminar Teacher for Society of Physics Students

Fall 2014 – Spring 2016

- Lead a weekly class that taught undergraduates from the Society of Physics Students introductory programming concepts by learning C++.

PROJECTS

Independent Study in Advanced Computer Graphics

Fall 2016

- Designed and implemented a 2D, grid-based fluid simulation (in C++).

Senior Design Project

Spring/Fall 2016

- Group project on dynamic usage of white-space broadcast TV bands (in Python). Served as Development Manager.

SKILLS

Programming Languages

- (Proficient) Java; (Familiar) Python , C/C++, MATLAB

Selected Software/Frameworks

- OpenGL, Git, Eclipse, Visual Studio, Android Studio, After Effects, Maya.

Operating Systems

- Microsoft Windows, Linux (Ubuntu).

MEMBERSHIP

UNL Honors Program

2012 – 2016

- Required extra academic achievements to be fulfilled throughout undergraduate education, including 24 hours of honors classes and completion of senior thesis.

UNL Society of Physics Students

2012 – 2016

- Secretary (2014 – 2016). Coding seminar teacher.
- Group of students passionate about physics and exploring the discipline further. Participated in many volunteering and scientific outreach opportunities.

UNL Math Club

2012 – 2016

Upsilon Pi Epsilon, International Computer Science Honor Society

Pi Mu Epsilon, National Mathematics Honor Society

Phi Eta Sigma, National Freshmen Honor Society

Alpha Lambda Delta, National Freshmen Honor Society

REFERENCES

Dr. Ronald Fedkiw, Fall Rotation Research Advisor

Computer Science Department
Stanford University
Gates Computer Science Bldg., Room 207
Stanford, CA 94305-9020
fedkiw@cs.stanford.edu

Dr. Stephen Reichenbach, Undergraduate Research Advisor

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University of Nebraska-Lincoln
Lincoln, NE 68588-0115
(402) 472-2401
reich@cse.unl.edu

Dr. Brian Y. Chen, Summer REU Research Advisor

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