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Davis Rempe

Interests

Machine Learning, Computer Vision, Computer Graphics, Physical Simulation.

Education

2017–Present **Ph.D. Computer Science**, *Stanford University*, Stanford, CA.
- Advisor: Prof. Leonidas Guibas
- Selected Coursework: Machine Learning, Computer Vision, Deep Generative Models

2012–2016 **B.S. Computer Science, Mathematics**, *University of Nebraska*, Lincoln, NE.
with Highest Distinction
- Minor: Physics
- Thesis: Effectiveness of Global, Low-Degree Polynomial Transformations for GCxGC Data Alignment
- Selected Coursework: Numerical Analysis, Numerical Linear Algebra, Partial Differential Equations, Computer Graphics, Digital Motion Graphics, Digital Visual Effects, Digital Animation

Research Experience

Sep. 2017–Present **Research Assistant**, *Stanford University, Stanford, CA*.
- Advisor: Prof. Leonidas Guibas
- Current projects: learning physical dynamics, physical scene understanding
- Past Projects: improved cloth simulation with machine learning, sound simulation for VR

June 2018–Sep. 2018 **Research Intern**, *Snap Inc., Venice, CA*.
- Implemented deformable simulation methods, improved cloth simulation with machine learning

Aug. 2016–July 2017 **Research and Development Intern**, *GC Image, Lincoln, NE*.
- Algorithms for peak detection and deconvolution in gas chromatography data

May 2016–July 2016 **Smart Spaces REU Intern**, *Lehigh University, Bethlehem, PA*.
- Advisor: Prof. Brian Chen
- Inexpensive augmented reality for 3D bone model visualization during surgery

June 2015–May 2016 **Undergraduate Researcher**, *University of Nebraska, Lincoln, NE*.
- Advisor: Prof. Stephen Reichenbach
- Data alignment algorithms for comprehensive two-dimensional gas chromatography

Jan. 2013–May 2014 **Undergraduate Researcher**, *University of Nebraska, Lincoln, NE*.
- Advisor: Prof. Aaron Dominguez
- Characterization and construction of particle detector chips for CERN

Publications

Peer-reviewed Papers

[1] **Davis Rempe**, S. Sridhar, H. Wang, and L. Guibas. Learning Generalizable Physical Dynamics of 3D Rigid Objects. *arXiv preprint (**In Submission**), arXiv:1901.00466*, 2019.

[2] **Davis Rempe**, S.E. Reichenbach, Q. Tao, C. Cordero W.E. Rathbun, and C.A. Zini. Effec-

tiveness of Global, Low-Degree Polynomial Transformations for GCxGC Data Alignment. ***Analytical Chemistry***, 2016.

[3] S.E. Reichenbach, **Davis 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***, 2015.

Other Presentations

[4] **Davis 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. *IEEE International Symposium on Dynamic Spectrum Access Networks (**DySPAN**) Demo Session, Baltimore, MD, USA*, March 2017.

[5] S.E. Reichenbach, **Davis Rempe**, Q. Tao, and C. Cordero. Simple models for second-column retention-time variability across peaks from GCxGC. *8th **Multidimensional Chromatography Workshop**, Toronto, ON, Canada*, January 2017.

Achievements and Awards

2016 **Lehigh Smart Spaces REU Outstanding Project**.

2015-2016 **Undergraduate Creative Activities and Research Experience (UCARE)**.

2013-2014 Funding for computer science (2015/16) and physics (2013/14) research for an academic year

2016 **Eunice Stout Scholarship**.

2013–2016 **D&F Eastman Scholarship**.

2012–2016 **Regents Scholarship**.

2012–2016 **Honors Program Book Scholarship**.

2013–2016 **College of Fine and Performing Arts Dean's List**.

2012–2016 **College of Arts and Sciences Dean's List**.

2013–2016 **University of Nebraska High Scholar**.

Spring 2013 **Arts and Sciences Celebration of Excellence for Academic Achievement**.

Professional Experience

Aug. 2014–Aug. 2015 **Software Development Intern**, *GC Image, Lincoln, NE*.

- Scientific software for visualizing and analyzing comprehensive two-dimensional gas and liquid chromatography data

Teaching Experience

Spring 2016 **Teaching Assistant**, *University of Nebraska, Lincoln, NE*.

- CSCE 310H - Honors Data Structures and Algorithms

Fall 2014–Spring 2016 **Coding Seminar Teacher**, *Society of Physics Students, Lincoln, NE*.

- Led a weekly class for undergraduate physics majors to learn introductory programming concepts through C++

Selected Projects

Fall 2016 **Independent Study in Advanced Computer Graphics**, *University of Nebraska*.

- Designed and implemented a 2D, grid-based fluid simulation.

Spring 2016–Fall 2016 **Senior Design Project**, *University of Nebraska*.

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

Technical Skills

Languages	*Experienced:* Python, C++, Java, *Familiar:* C#, C, MATLAB
Libraries:	Tensorflow, PyTorch, OpenGL, Bullet Physics
Software	Vim, Git, Blender, Unity, Autodesk Maya, Adobe After Effects
OS	Microsoft Windows, Linux (Ubuntu)

Membership

2012–2016 **Honors Program**, *University of Nebraska*.

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

2012–2016 **Society of Physics Students**, *University of Nebraska*.

- 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.

2012–2016 **Math Club**, *University of Nebraska*.

2015– **Upsilon Pi Epsilon**, *International Computer Science Honor Society*.

2014– **Pi Mu Epsilon**, *National Mathematics Honor Society*.

2013– **Phi Eta Sigma**, *National Freshmen Honor Society*.

2013– **Alpha Lambda Delta**, *National Freshmen Honor Society*.

References

Available upon request.