

TRAVIS AARON HOPPE

Curriculum Vitæ
travis.hoppe@gmail.com

PhD Physics
(775) 287-4033

professional experience

2016-current

Data Scientist / Portfolio Analyst

Developed analytic tools, models, and software to process the natural language of text (using distributional embeddings such as word2vec) over the NIH grants corpus for senior leadership. Analyzed grant and publication portfolios, evaluating metrics such as clinical impact, technological impact, and award rates to build quantitative comparisons between various populations. Processed PDFs to extract data from historical records. Built machine learning models for various tasks (classification, regression, outlier detection).

2014-2016

Postdoctoral Fellowship at National Institutes of Health

Theoretical Biophysics with Robert Best at the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), part of the National Institutes of Health (NIH).

Served as a postdoctoral fellow under the lab of Dr. Robert Best. Researched novel integration schemes for molecular dynamics simulations. Developed protein models for tertiary structure prediction from primary sequence.

2011-2014

Postdoctoral Fellowship at National Institutes of Health

Physical Biochemistry with Allen Minton at the NIH, NIDDK.

Served as a postdoctoral fellow under the lab of Dr. Allen Minton. Developed hard-sphere models to account for crowding in biomolecular simulations. Developed approximate potentials to model anisotropic charge distributions.

education

2011

Doctor of Philosophy, Physics

Drexel University with Jian-Min Yuan. **Thesis**, *On the Role of Entropy in the Protein Folding Process*.

2008

Master of Science, Physics

Drexel University

2005

Bachelor of Science, Physics

Bachelor of Science, Mathematics

University of Nevada

publications

Policy

2019

Topic Choice Contributes to Lower Rate of NIH Awards to African-American/Black Scientists, Travis Hoppe, Aviva Litovitz, Kristine Willis, Rebecca Meseroll, Matthew Perkins, B. Ian Hutchins, Alison Davis, Michael Lauer, Hannah Valentine, James Anderson, & George Santangelo, **Science Advances**.

2019

The NIH Open Citation Collection: A public access, broad coverage resource, Ian Hutchins, Kirk Baker, Matthew Davis, Mario Diwersy, Ehsanul Haque, Robert Harriman, Travis Hoppe, Stephen Leicht, Payam Meyer, George Santangelo, **PLoS Biology**.

2017

Additional support for RCR: A validated article-level measure of scientific influence, Ian Hutchins, Travis Hoppe, Rebecca Meseroll, James Anderson, & George Santangelo, **PLoS Biology**.

Protein-Protein Interaction

- 2019 **Non-specific Interactions Between Macromolecular Solutes in Concentrated Solution: Physico-Chemical Manifestations and Biochemical Consequences**, Travis Hoppe & Allen Minton, *Frontiers in Molecular Biosciences*.
- 2016 **Incorporation of Hard and Soft Protein-Protein Interactions into Models for Crowding Effects in Binary and Ternary Protein Mixtures**, Travis Hoppe & Allen Minton, *Journal of the Physical Chemistry B*.
- 2015 **Dependence of Internal Friction on Folding Mechanism**, Wenwei Zheng, David De Sancho, Travis Hoppe & Robert B. Best, *Journal of the American Chemical Society*.
- 2015 **An equilibrium model for the combined effect of macromolecular crowding and surface adsorption on the formation of linear protein fibrils**, Travis Hoppe, Allen Minton, *Biophysical Journal*.
- 2013 **A simplified representation of anisotropic charge distributions in proteins**, Travis Hoppe, *Journal of Chemical Physics*.
- 2013 **Singular Value Decomposition of the Radial Distribution Function for Hard Sphere and Square Well Potentials**, Travis Hoppe, *PLoS ONE*.
- 2010 **Protein Folding with Implicit Crowders: A Study of Conformational States Using the Wang-Landau Method**, Travis Hoppe, Jian-Min Yuan, *Journal of Physical Chemistry B*.

Protein Topology & Graph theory

- 2014 **Integer sequence discovery from small graphs**, Travis Hoppe, Anna Petrone, *Discrete Applied Mathematics*.
- 2009 **Entropic flows, crowding effects, and stability of asymmetric proteins**, Travis Hoppe, Jian-Min Yuan, *Physical Review E*.

Experimental Modeling

- 2014 **Programmable Nanoscaffolds that Control Ligand Display to a G-Protein Coupled-Receptor in Membranes allow Dissection of Multivalent Effects**, Andrew Dix, Daniel Appella, Travis Hoppe, et al., *Journal of the American Chemical Society*.
- 2014 **Quantification of plasma HIV RNA using chemically engineered peptide nucleic acids**, Chao Zhao, Daniel Appella, Travis Hoppe, et al., *Nature Communications*.
- 2008 **The importance of EBIT data for Z-pinch plasma diagnostics**, A S Safronova, Travis Hoppe, et al., *Canadian Journal of Physics*.
- 2006 **Spectroscopic and Imaging Study of Combined W and Mo-pinch Generators**, Alla Safronova, Travis Hoppe, et al., *IEEE Transactions on Plasma Science*.

conferences

- 2016 **Biophysical Society: Los Angeles**
Poster: Coevolutionary signal enhancement
- 2015 **Biophysical Society: Baltimore**
Seminar: Mean-field lattice-model IDPs, Binding Affinity & Specificity

- 2014 **Advances in Enhanced Sampling Algorithms: Telluride**
Seminar: Topological considerations in the Wang-Landau algorithm
- 2013 **Biophysical Society: Philadelphia**
Seminar: Coarse-grained Electrostatic Models for Protein Solutions
- 2010 **Biophysical Society: San Francisco**
Poster: Wang-Landau Density of States in Crowded Protein Environments
- 2009 **Drexel University Libraries' Communication Symposium:
The Hidden Costs of Scholarly Communication**
Invited Panel Member
- 2009 **Biophysical Society: Boston**
Poster: Exhaustive Properties of Simple Lattice Peptides

awards

- 2017 **Office of the Director's Honor Award**
Outstanding support for the Grants Support Index & Next Generation Research Initiative Analytical Team
- 2014 **Top Presentation Award**
Institution-wide recognition during the NIDDK Annual Conference.
- 2010 **Research Assistant Grant**
Competitive grant from Drexel Physics Department on the basis of outstanding research and teaching.
- 2010 **Student Research Achievement Award (SRAA)**
Top poster at the Biophysical Society 2010 meeting.
- 2009 **Department Research Award (Senior Division)**
Given by the Drexel Physics Department, this award recognized a high proficiency in both original research and synthesis of results into publications.
- 2008 **Department Research Award (Junior Division)**
Restricted to the first two years of study, the junior division award was awarded for early achievements in research.
- 2007 **Teaching Assistant of the Year**

Recognition by Drexel University as the top Teaching Assistant in the College of Arts and Sciences.

teaching (Drexel)

- 2011 **PHYS 305**, Computational Physics II*
- 2010 **PHYS 304**, Computational Physics I*
PHYS 160, Introduction to Scientific Computing*
PHYS 305, Computational Physics II*
- 2009 **PHYS 304**, Computational Physics I*
PHYS 160, Introduction to Scientific Computing*
DSP 099, Dragon Summer Program: Remedial Mathematics
PHYS 100, Preparation for Engineering Studies
PHYS 305, Computational Physics II*
- 2008 **PHYS 304**, Computational Physics I*
PHYS 102, Fundamentals of Physics II*

PHYS 115, Contemporary Physics III*
PHYS 114, Contemporary Physics II*
 2007 **PHYS 113**, Contemporary Physics I*
PHYS 102, Fundamentals of Physics II, Lab
PHYS 115, Contemporary Physics III*
PHYS 114, Contemporary Physics II*
 2006 **PHYS 113**, Contemporary Physics I*
TDEC 101, Fundamentals of Physics I, Lab
TDEC 103, Fundamentals of Physics III*
TDEC 102, Fundamentals of Physics II*
 2005 **TDEC 101**, Fundamentals of Physics I*

*Developed new curricula and modernized the Computational Physics, Contemporary Physics and Introduction to Scientific Computing courses at Drexel.