Carlos D. Alas

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Summary

Biophysicist with over 8 years of University level experimental, theoretical, and computational research and professional experience in data science and soft matter physics.

Skills

Programming: MATLAB, Python, C/C++, Git, LaTex, Mathematica, Julia, HTML
Data Science: Pyspark, SQL, AWS, Databricks, Machine Learning

Professional Experience

The Travelers Indemnity Company **Jun 2022 – Aug 2022**
Data Science Leadership Development Program Intern

- Designed, validated, and benchmarked a metric for measuring trip regularity on 50+ billion IntelliDrive data points.
- 1st place team in Intern Case Competition: doubled our market share and earnings on auto policies
- Performance evaluation: Extraordinary (awarded to $< 1\%$ of DSLDP interns).

Tutoring **Jul 2014 – Dec 2018**
1-1 and group tutoring at college & university levels

- California Polytechnic State University, San Luis Obispo Physics Department Learning Center & Educational Opportunities Program: assisted in physics, math, and chemistry courses
- Antelope Valley College Learning Center tutor & suppl. instruction leader: assisted in math & science courses

Recent Projects

Measure trip regularity of drivers and assess risk (Travelers Internship project, **Summer 2022**)

Churn predictions on customer transaction data (Stripe's intern assessment data set, **Spring 2022**)

Cat/Dog picture classifier (CSCI 585 course project, **Fall 2021**)

Study diffusion in inhomogeneous media using kinetic Monte Carlo methods (PHYS 516 course projects, **Spring 2021**)

Education

University of Southern California **Aug 2018 – Jul 2023**
Ph.D. in Physics & M.S. in Computer Science

- Relevant Courses Passed: Database Systems, Methods of Computational Physics, Thermodynamics & Statistical Physics
- Relevant Courses Planned: Machine Learning, Deep Learning and Its Applications
- Research Assistant in Theoretical & Computational Membrane and Protein Biophysics and Teaching Assistant in Physics
- Advisor: Dr. Christoph A. Haselwandter | GPA: 3.5

California Polytechnic State University, San Luis Obispo **Sep 2015 – Dec 2017**
B.S. in Physics w/ minor in Mathematics

- UC, Boulder SMRC Summer Research Assistant in Experimental Fluid Dynamics on Liquid Crystal Films
- Thesis: Swimming of microorganisms in quasi-2D membranes (Published in JFM)
- Advisor: Dr. Tatiana Kuriabova | GPA: 3.4

Publications

K.R. Ferguson, Z. Qi, A. Green, **C. Alas**, C. Briggs, C. S. Park, M. A. Glaser, J. E. Maclennan, and N. A. Clark, *Experimental studies of two-dimensional laminar jet flows in freely suspended liquid crystal films*, arXiv:1808.01747 [cond-mat.soft] (preprint, 2018).

C. Alas, T. R. Powers, and T. Kuriabova, *Swimming of microorganisms in quasi-two-dimensional membranes*, J. Fluid Mech. 911, A35 (2021).

C. D. Alas and C. A. Haselwandter, *Dependence of protein-induced lipid bilayer deformations on protein shape*, arXiv:2208.05011 [physics.bio-ph] (in review, 2022).

C. D. Alas, O. Kahraman, and C. A. Haselwandter, *Thermosensing through membrane mechanics*, (in preparation, 2022).

C. D. Alas and C. A. Haselwandter, *Protein shape and protein-induced bilayer midplane deformations*, (in preparation, 2023).

C. D. Alas, Y. Li, O. Kahraman, and C. A. Haselwandter, *Stochastic lattice model for emerin nanodomains*, (in prep., 2023).

Talks

C. Alas and T. Kuriabova, *Swimming of filamentous biological microorganisms in quasi-2D membranes*, CSM Student Research Conference, California Polytechnics State University, San Luis Obispo, CA, USA (2018).

C. D. Alas and C. A. Haselwandter, *Dependence of protein-induced lipid bilayer thickness deformations on protein shape*, APS March Meeting, McCormick Place, Chicago, IL, USA (2022).

C. D. Alas and C. A. Haselwandter, *Thermosensing through membrane mechanics*, APS March Meeting, Caesar's Forum Convention Center, Las Vegas, NV, USA (Upcoming, 2023).

Posters

C. Alas and T. Kuriabova, *Swimming of filamentous biological microorganisms in quasi-2D membranes*, CSM Student Research Conference, California Polytechnics State University, San Luis Obispo, CA, USA (2018).

C. D. Alas and C. A. Haselwandter, *Dependence of protein-induced lipid bilayer thickness deformations on protein shape*, USC Computational Biology Symposium, University of Southern California, Los Angeles, CA, USA (2022).

Fellowships, Scholarships, and Awards

Diversity, Inclusion, and Access Initiative Fellowship **Aug 2018**

Frost Summer Research Scholarship **Jun 2017**

UC Boulder SMRC REU Scholarship **Jun 2016**

Helen SanderCock Foundation Scholarship **May 2016**

Flight Test Historical Foundation Scholarship **May 2015**

Antelope Valley College's Honors Convocation Subject Area Award in Physics **May 2015**
Nominating Instructors: Dr. Jason Bowen and Dr. Alexandra Schroer

Volunteer Experiences

Antelope Valley College

- Cal Tech Science Olympiad Competition Event Designer &/or Supervisor (STEM Program Director: Christos Valiotis) **Every Feb 2015–2019**
- Barnes and Noble Physics Experiments Demonstration, Palmdale, CA (STEM Outreach Coordinator: Jamie Jones) **Jun 14, 2018**

California Polytechnic State University, San Luis Obispo **Jan 27, 2018**

Baywood Elementary School Physics Experiments Demonstrations, Los Osos, CA (Event Director: Dr. Karl Saunders)