Carlos D. Alas

Los Angeles, California
calas@usc.edu cdalas.com LI GH RG

Skills

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

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.
- Doubled our market share and earnings on auto policies to earn 1st place in Intern Team Case Competition
- Earned an 'Extraordinary' performance evaluation (awarded to $< 1\%$ of DSLDP interns).

Tutoring **Jul 2014 – Dec 2018**

1-1 and group tutoring at college & university levels

- Strengthened physics, math, and chemistry skills of students as California Polytechnic State University, San Luis Obispo Physics Department Learning Center & Educational Opportunities Program tutor
- Honed math & science skills of students as Antelope Valley College Learning Center tutor & suppl. instruction leader

Recent Projects

Measured trip regularity of drivers and assessed risk (Travelers Internship project, **Summer 2022**)

Predicted customer churn on transaction data (Stripe's toy data set, **Spring 2022**)

Classified cat/dog pictures (CSCI 585 course project, **Fall 2021**)

Investigated diffusion in inhomogeneous media using KMC 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 | GPA: 3.5

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

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

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*, Phys. Rev. E, 107, 024403 (2023).

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