

# Santiago Vargas

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## Contact

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## Education

B.S., Chemistry and Physics (Cum Laude)- Harvard College, Cambridge, Ma.

PhD (Ongoing). Theoretical/Computational Chemistry - UCLA, Los Angeles, Ca

## Honors and Awards

- Fulbright (Chile Science Initiative) – January 2019
- UCLA Competitive Edge Fellowship
- Harvard College Research Program Fellowship - May 2018
- David Rockefeller Experience Abroad Award – May 2017
- Harvard PRISE Fellowship – May 2016

## Publications

**S. Vargas**, S. Zamirpour, S. Menon, A. Rothman, S. Sim, T. Menke, and A. Aspuru-Guzik. Team-based Learning for Scientific Computing and Automated Experimentation: Visualization of Colored Reactions. (2019) <https://doi.org/10.1021/acs.jchemed.9b00603>.

*Seasonal changes in diet and toxicity in the Climbing Mantella frog (Mantella laevigata).* Moskowitz, N. A.; Roland, A. B.; Fischer, E. K.; Ranaivorazo, N.; Vidoudez, C.; Aguilar, M. T.; Caldera, S. M.; Chea, J.; Cristus, M. G.; Crowdis, J. P.; Demessie, B.; Desjardins-Park, C. R.; Effenberger, A. H.; Flores, F.; Giles, M.; He, E. Y.; Izmaylov, N. S.; Lee, C. C.; Pagel, N. A.; Phu, K. K.; Rosen, L. U.; Seda, D. A.; Shen, Y.; **Vargas, S.**; Murray, A. W.; Abebe, E.; Trauger, S. A.; Donoso, D. A.; Vences, M.; Oconnell, L. A. 2018.

## Professional Experience

Research Assistant, Anderson Lab, Massachusetts General Hospital (June 2019, August 2019)  
Applying machine vision and artificial intelligence to the detection of cancer in low-resolution images to build a phone-based detection scheme for portable detection. Created a platform to permute and optimize across a host of algorithms and store information within dataframes.

Research Assistant, Aspuru-Guzik Laboratory, Harvard University (May 2018–August 2018)

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Researching the use of Josephson Junction-based circuits to create viable two-state, long decoherence qubit designs. Using various optimization methods to create a viable, high-throughput search workflow for finding effective qubit designs computationally.

Organic Chemistry Tutor, Summer School, Harvard University (May 2018-August 2018)  
Tutored a cohort of about 12 students through summer school iteration of Organic Chemistry I and II. Helped plan challenge materials for this course and organized group review sessions.

Section Head, E-17 Organic Chemistry, Harvard Extension School (August 2017-December 2017)

Taught organic chemistry section including methods on TLC, Column Chromatography, FT-IR, and Green Chemistry.

Social Entrepreneurship Intern, Ashoka International (May 2017 - August 2017)

Worked with NGOs in Chile, Argentina, and Uruguay to find funding, personnel, resources, and government/private sector contacts

Research Assistant, Calarco Laboratory, Harvard College (August 2015–August 2016)

Investigated intron signals in *C.elegans* worms that statistically alter splicing patterns in these worms. Methods included using molecular biology to create constructs that would report each splicing event and using high-throughput sequencing techniques to sample for events. Later work was done to physiologically confirm the constructs we had created in order to see if the statistical/high-throughput method translated into detectable changes in splicing behavior. Created a two-color splicing reporter that would report exon inclusion/exclusion events in *C.Elegans*.

## Outreach and Service

Engineers Without Borders, Project Lead, (Summer 2017 - Present)

Leading a project to build and maintain a water distribution system in Los Sanchez, Dominican Republic. Built a system that services 200 people and won the National Chapter Award.

Soccer Without Borders Boston, Coach, (Summer, Fall 2018)

Coaching kids in underserved populations in East Boston including recent immigrant and asylee populations. Raised \$3,000 for the program through a fundraiser with the NYC Marathon.

Harvard Chinatown Afterschool Program, Grade Coordinator (Fall 2016, Spring 2017)

Grade coordinator for the Chinatown program where we tutor underprivileged schoolchildren in the Boston Chinatown community.

Harvard Habitat for Humanity (Winter 2017, Spring 2016)

Volunteered to build homes for the homeless in Avery County, North Carolina. Also worked

with a group building two houses in Lafayette, LA.

### Techniques and Skills

- Programming
  - Python - Experienced including use of several packages such as tensorflow, seaborn, sklearn, opencv, pandas
  - Matlab - Experienced
  - Java – Experienced
  - R - Comfortable
  - C++ - Comfortable
  - Lisp - Comfortable
  - Mathematica - Comfortable
  - Spark - Comfortable
  - Hadoop - Comfortable
  - MapReduce - Comfortable
  - Git Version Control - Experienced
- Compound Characterization Assays
  - IR
  - UV VIS
  - FT-IR
  - MALDI-ToF
  - NMR
- Air-free reaction chemistry
- Column Chromatography
- Thin- Film Chromatography
- High performance liquid chromatography
- Transformation, culture, and expression of novel proteins in *E. coli* and *C.Elegans*
- Gel Electrophoresis
- PCR
- Native Spanish Fluency reading, writing, speaking

### References

**Dr. Anastassia Alexandrova**, Professor and Vice Chair for Undergraduate Education.  
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