Newton Huy Nguyen

California Institute of Technology, Division of Earth & Planetary Sciences
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EDUCATION

Ph.D. Candidate, California Institute of Technology | Environmental Engineering Science 2018-Present
Thesis: Algorithms and Techniques to Optimize Sensing of Greenhouse Gases.

M.S., California Institute of Technology | Environmental Engineering Science 2017-2018
Thesis: Quantifying Global Methane Emissions with Bayesian Models.

B.A., University of California at Berkeley | Geophysics, Highest Honors 2012-2016
Thesis: Neural Networks to Model Fluid Flows.

TECHNICAL PROJECTS

SpectralFits.jl, Julia & Python June 2020-Present
- Designed & implemented flexible interface for XXX. Capabilities include choice of molecule and instrument simulation.
- Implemented Bayesian inversion algorithm with capabilities to infer statistical measures, e.g., Shannon Information content, Degrees of Freedom, & Posterior Error Covariance.
- Resulted in 2 invited talks and 1 peer-reviewed publication.

OHMethane, MATLAB Jan 2018-Dec 2018
- Developed model to simulate atmospheric methane chemistry & infer global emissions given chemical constraints.
- Implemented Bayesian algorithm to infer climate-relevant emissions including methane, CO, & other species.
- Resulted in 2 conference presentations and 2 peer-reviewed publications

RESEARCH EXPERIENCE & PROFESSIONAL POSITIONS

Ph.D. Student Research Assistant, Caltech Sep 2017-Present
Supervisors:
- Designed four research areas on quantifying and monitoring methane emissions, which integrated advances in physical, chemistry, instrument engineering, and statistical computing.
- Authored and was rewarded a fellowship by the National Science Foundation to modernize methane monitoring capabilities
- Taught and led students in recitation sections for graduate-level satellite Remote Sensing and Biogeochemistry courses (teaching effectiveness 4.9/5.0)
- Mentored 2 students and 1 software engineer in developing skills in satellite remote sensing

Research Assistant, Lawrence Berkeley National laboratory June 2016 - July 2017
Supervisors:
- Analyzed NASA satellite data in order to study the sensitivity of Earth's climate to carbon emissions
- Parallelized a numerical radiative transfer model to run on NASA's Pleiades Supercomputer
- Resulted in 2 peer-reviewed publications and an award for best conference presentation

NASA JPL Satellite stuff??? Other jobs?

HONORS & AWARDS

Caltech Engineering Division New Horizons Prize for Excellence in Mentorship & Service 2021
National Science Foundation Graduate Research Fellowship for Scientific Merit *NSF* 2018
Boston Marathon Qualifier 2019, 2020
3rd Place, US Blind Athletes National Championships in the Marathon 2019
1st Place, Collegiate Triathlon National Championships in Para-athlete division 2016

PEER REVIEWED PUBLICATIONS

Google Scholar https://scholar.google.com/citations?user=AziOzdwAAAAJhl=enoi=sr
Orcid ID: 0000-0002-9118-8672

3. **N.H. Nguyen**, A.J. Turner, Y Yin, M.J. Prather, C. Frankenberg. (2020) Effects of Chemical Feedbacks on Decadal Methane Emissions Estimates. *Geophysical Research Letters*. https://doi.org/10.1029/2019GL085706.

2. W.D. Collins, D.R. Feldman, **N.H. Nguyen**. (2018) Large regional shortwave forcing by anthropogenic methane informed by Jovian observations. *Science Advances*. https://doi.org/10.1126/sciadv.aas9593.

1. D.R. Feldman, W.D. Collins, Y Shea, **N.H. Nguyen**, X Liu, B Wielicki. (2016) Observing Climate Change With Both Shortwave and Longwave Hyperspectral Satellite Instrumentation. *Light, Energy & the Environment*. https://doi.org/10.1364/HISE.2016.HW2F.1.

PUBLISHED DATASETS AND CODE

E.L. McCormick, D. Dralle, W.J. Hahm, A. Tune, L. Schmidt, K.D. Chadwick, D.M. Rempe (2021). Dataset for "Evidence for widespread woody plant use of water stored in bedrock." *CUAHSI HydroShare*. https://doi.org/10.4211/hs.a2f0d5fd10f14cd189a3465f72cba6f3.

E.L. McCormick, D. Dralle, W.J. Hahm, A. Tune, L. Schmidt, K.D. Chadwick, D.M. Rempe. Code for manuscript: "Evidence for widespread woody plant use of water stored in bedrock." (v1.0.0). *Zenodo*. https://doi.org/10.5281/zenodo.4904037.

INVITED PRESENTATIONS

UT Austin "Water, Climate, and Energy Seminar" (2022) "From source to sink: towards constraining methane sources and sinks"
Harvard () "From source to sink: towards constraining methane sources and sinks"

American Geophysical Union Fall Meeting () ""

CONFERENCE ABSTRACTS

N.H. Nguyen, K Cossel, E Waxman, N Newbury, I Coddington, C Frankenberg. (2021) Destructive Interference: Future Long-term Greenhouse Gas Monitoring with Dual-Comb Spectroscopy Needs More Accurate Spectroscopic Parameters. Poster Presentation, American Geophysical Union, San Francisco, CA.

N.H. Nguyen, C Frankenberg, A.J. Turner, Y Yin, M.J. Prather. (2019) Quantifying the Effect of Neglecting Variable Methane Lifetime on Methane Emissions Estimates, Poster Presentation, American Geophysical Union, San Francisco, CA.

N.H. Nguyen, C Frankenberg, Y Yin, A.J. Turner. (2018) Effects of Methane and Hydroxyl Radical Chemistry on Decadal Methane Emissions Estimates, Poster Presentation, American Geophysical Union, San Francisco, CA.

D Feldman. W.D. Collins, B.A. Wielicki, Y Shea, M.G. Mylnczak, C Kuo, **N.H. Nguyen**. (2017) How Continuous Observations of Shortwave Reflectance Spectra Can Narrow the Range of Shortwave Climate Feedbacks, Poster Presentation, American Geophysical Union, San Francisco, CA.

LEADERSHIP & SERVICE

Cofounder, Systemic Access Mentorship Program Aug 2020-Present
- Organized and coordinated a national mentorship program so that blind students in science and engineering have role models and resources to succeed
- Matched 40 mentors and mentees across the US and 2 other countries

Caltech Graduate Admissions Policy Committee Sep 2020 - March 2021
- Selected by the President of Caltech to be student representative for the faculty committee tasked with increasing student body diversity and rewriting graduate admissions policies
- Analyzed past admissions data and policies from other institutions to discern features and policies that increased student diversity
- Proposed three new policies to make admissions less biased, which were implemented by the university

Founder & President, Caltech Triathlon Club Sept 2019-Present
- Coached track and biking practices for more than 20 athletes
- Organized and coordinated 3 virtual triathlons during COVID with UCLA and USC teams, which involved about 100 participants

PRESS

Runners' World Magazine: How Running Has Helped Newton Nguyen Navigate Life as a Blind Man Oct 2021
Ally Commercial: We're All Better Off With An Ally Jul 2021
Mini-Documentary: Marathoning Through Life with Vision Loss Oct 2021
Careers for the Blind Podcast: Episode 35 - Climate Scientist Newton Nguyen Oct 2021
Berkeley National Lab News: Newton Nguyen's Vision Loss Doesn't Slow Him Down Oct 2016
KTVU News: 98 percent blind Cal Berkeley student competes as triathlete March 2015

TEACHING EXPERIENCE

University of Texas at Austin

GEO 371/391 Vadose Zone Hydrology (Web Based) Undergraduate/Graduate
Teaching Assistant S2021; Professor: Dr. Daniella Rempe; Enrollment: 18 students (9 grad, 9 undergrad)
- Assisted with office hours and preparation of instructional material
- Prepared and conducted lecture covering Hydrus 1D software and Google Earth Engine

TC 358 Law and Ethics of Climate Change (Web Based) Undergraduate
Teaching Assistant F2020; Professor: Amon Burton; Enrollment: 18 students
- Designed new course content focusing on hydrology and climate change
- Prepared and conducted lecture on hydrogeology issues of central TX
- Managed student meetings, visiting speakers, field trips, and grading

TECHNICAL SKILLS & EXPERTISE

Skills: Python | Julia | R | Matlab | Fortran | Git | Bash | Numpy/Scipy | SKLearn/Pytorch

Expertise: Numerical computing | Probability | Bayesian statistics | High-performance computing | Greenhouse gas emissions | Remote sensing | Satellite spectroscopy | Machine learning