Edward Greg Huang

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Nationality: American

Current position

Research assistant, Department of Mathematics, University of California at Berkeley

Areas of interest

Algorithmic information theory • Biophysics • Deep learning

Education

2019 B.A. Applied Mathematics, University of California, Berkeley
2016 Study abroad, University of Hong Kong

Academic positions

2018 - 2019 Student Advisor to the Regents, *University of California*
2018 Artificial intelligence research assistant, *Intelligent Robotics Group, NASA Ames*
2018 REU research fellow, *Santa Fe Institute*
Advisor: David H. Wolpert
2017 - present Biophysics research assistant, *Department of Mathematics, UC Berkeley*
Primary Investigator: Rainer K. Sachs
2015 - 2017 Evolutionary ecology research assistant, *Department of Environmental Science, UC Berkeley*
Primary Investigators: Rosemary G. Gillespie and George Roderick

Industry & nonprofit experience

2018 Senior unit-level manager, *Berkeley Student Cooperative*
2017 - present Brand ambassador, *Klättermusen AB*
2016 - 2018 Vice President, *Cal Hiking and Outdoor Society*
2016 Financial analyst intern, *EQS Group AG*
2015 - 2016 Architectural intern, *Project M+*

Publications

In preparation

2020 Hada M, Wang SC, Zhao LY, **Huang EG**, Sachs RK. (2020) Synergy theory for chromosome aberrations after exposure to mixed fields. *Manuscript in preparation.*

2019 Chang PY, **Huang EG**, Lin Y, Ham DW, Sachs RK, Hada M, Blakely EA. (2019) Murine tumors after exposures to mixtures simulating galactic cosmic rays: three recent experiments and their synergy theory interpretations. *Manuscript in preparation.*

2019 **Huang EG**. (2019) Algorithmic information and inference devices. *Manuscript in preparation.* PDF

Peer-reviewed journal articles

2019 **Huang EG**, Lin Y, Ebert M, Ham DW, Zhang CY, & Sachs RK. (2019) Synergy theory for murine Harderian gland tumours after irradiation by mixtures of high-energy ionized atomic nuclei. *Radiation and Environmental Biophysics.* 58(2): 151-166. https://doi.org/10.1007/s00411-018-00774-x

2018 Krehenwinkel H, Fong M, Kennedy S, **Huang EG**, Suzuki N, Cayetano L, & Gillespie RG. (2018) The effect of DNA degradation bias in passive sampling devices on metabarcoding studies of arthropod communities and their associated microbiota. *PLoS ONE 13(1): e0189188.* https://doi.org/10.1371/journal.pone.0189188

Invited talks & presentations

* indicates presenter

2019 Blakely EA*, Bakke J, Grover A, Rosen C, Bjornstad KA, Mao JH, **Huang EG**, Ham DW, Sachs RK, & Chang PY. Murine Harderian gland tumorigenesis induced by dual, rapid-sequence particle beams. Talk to be given at the *International Congress of Radiation Research*; Aug 25 -29; Manchester, UK.

2019 **Huang EG***, Ham DW, Lin Y, Wang S, Zhao L, Zhang Y, Blakely EA, Chang PY & Sachs RK. (2019) Synergy theory: murine Harderian gland tumors and *in vitro* chromosome aberrations induced by exposure to mixed beams with some high-LET components. Talk given at: *2019 NASA Human Research Program Investigators' Workshop*; Jan 22 - 25; Galveston, Texas, USA. Abstract [PDF] & Slides [PDF]

2018 **Huang EG*** & Wolpert DH. (2018) Connections between Turing machines and a formalization of knowledge. Talk given at: *Santa Fe Institute REU Final Talks*; Aug 9; Santa Fe, New Mexico, USA. Video

2017 Ham DW, Gao J, Song BL, Yu J, Zhao LY, **Huang EG***, Lin Y, & Sachs RK. (2017) Synergy theory in biology: Simulating radiation damage during interplanetary voyages as an example. Poster session presented at: *11th Annual Biology and Mathematics in the Bay Area Conference; Nov 18*; San Francisco, California, USA. PDF

2016 **Huang EG*** & Rominger AJ. (2016) Managing large datasets from ecological fieldwork. Talk presented at the *Department of Environmental Science, Policy, and Management at UC Berkeley; May 6*; Berkeley, California, USA.

Book chapters

2015 Adhikari A, Ghosh DJ, **Huang EG**, et al. (2015) Theory Meets Data: A Data Scientist's Handbook to Statistics. *UC Berkeley Dept. of Statistics*. PDF

Authored software

2019 **Huang EG**, Ham DW, Lin Y, Wang S, Ebert M, Zhang CY, & Sachs RK. (2019) `synergy`: A `R`-package of tools and data to model mixed radiation fields for radiobiologists. *In preparation for CRAN*. *GitHub*

2017 **Huang EG**, Rominger AJ. (2017) `kokua`: `R`-package of tools and data for Hawaiian ecology. *GitHub*

2016 Rominger AJ, **Huang EG**. (2017) `hdimDB`: Tools for biocollections database management in `R`. *GitHub*

Selected programming projects

2019 `synergy`: Package of novel prediction methods for space radiation induced cancer risk in `R` for CRAN.
2019 `guavabots`: Dynamic graph search algorithms based on incomplete and unreliable data in Python.
2019 `numAnalysis`: Algorithms for numerical approximation methods in MATLAB.
2018 `deepFlood`: Deep learning framework written for NASA to track floods using satellite imagery.
2018 `abyss`: Rogue-like platform video game in Java.
2018 `BearMaps`: Web mapping service for the city of Berkeley in Java.
2018 `deque`: Data structure implementation in Java.
2017 `simpleNeuralNet`: General feedforward neural network API in Python.
2017 `multiAgentSearch`: Implementation of search algorithms in Python.
2017 `housingEstimate`: Machine learning model for predicting housing prices in scipy.
2017 `hdimGeo`: Interactive map of biocollections data from the NSF Hawaii Dimensions project in `R`.
2017 `kokua`: Open-source `R`-package of tools and data for Hawaiian ecology.
2017 `hdimShiny`: Web application for ecological data wrangling.
2016 `hdimDB`: Open-source package of tools for biocollections database management in `R`.
2016 `schemeInterpreter`: Direct executor for Scheme programs in Python.
2016 `ants`: Object-oriented tower defense game in Python.
2016 `yelpMaps`: Interactive map of Yelp data in Bay Area in Python.
2016 `hog`: Turn based dice rolling game with an AI opponent in Python.

Grants, honors & awards

2019 Nominee, Kenneth Priestley Award
2019 Nominee, Outstanding Student Leadership Award, UC Berkeley
2018 REU Research Fellowship, National Science Foundation Grant No. 1757923
2017 Dean's List, UC Berkeley
2016 Freeman Foundation Scholarship
2016 ASUC Student Opportunity Fund Grant, UC Berkeley
2016 ASUC Academic Opportunity Fund Grant, UC Berkeley

Skills

Programming: Python, R, Java, SQL, MATLAB, Scheme (Lisp), Bash.

Libraries, APIs, and Technologies: TensorFlow, Keras, Spark, Jupyter, scipy, numpy, pandas, matplotlib, Seaborn, stats, devtools, ggplot2, shiny, plyr, testthat, Git, LaTeX, Markdown, AutoCAD.

Languages: English (native), Cantonese (native), Mandarin (basic), Spanish (basic).

Memberships & affiliations

Regents of the University of California

- Public Engagement and Development Committee
- Finance and Capital Strategies Committee
- Investments Committee

Berkeley Student Cooperative
Cal Hiking and Outdoor Society (CHAOS, formerly the UC Hiking Club)
Cal Entomology Club
Cal Boxing

Miscellaneous

Erdős number: 4