



Vredenburgh & Associates, Inc.

Human Factors, Safety, Biomechanics and Organizational Consulting

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MICHAEL JOSEPH VREDENBURGH

Curriculum Vitae

CURRENT POSITION

Biomechanics Consultant, Vredenburgh & Associates, Inc. (2014 - present)

Systems and Research Analyst (2009 – 2014)

Forensic and Research Intern (2006 – 2009)

Serves as a forensic (the application of science to law) biomechanics consultant for product liability and personal injury cases. Performs biomechanics analyses and laboratory testing. Conducts original research: prepares scientific papers and presents research at scientific conferences. Expertise in adolescent safety and expected behavior. Creates animations and forensic videos. Performs computer systems updates and maintenance.

EDUCATION

University of California, Berkeley

B.S. Bioengineering, Computational biology concentration (2016)

Selected Projects:

- Top Prize Winner at AngelHack, SF 2015: Wrote the back end for a transactional email service that chooses the most effective emails out of a large possible pool in real-time, based on clicks to the email's "call to action."
- Designed and implemented k-nearest neighbor's machine learning algorithm for hand written letter recognition.
- Designed RNA Hairpin loop: Created Python script to take an effector as an input; the output was a sequence creating a hairpin RNA loop serving as an "on-off" logic gate.
- Protein Database web scraper: Created Python script to automate the creation of protein "playing cards," including: a picture, stoichiometry, and organism of origin for random proteins from the RCSB protein database. After scraping the data, the script then wrote HTML and CSS to make the cards printable.
- Tested single nucleotide polymorphism (SNP) tools: Developed Python script to automate SNP tool testing.
- Sliding Block Puzzle Solver: Developed Java script that solved a sliding block puzzle using a breath first traversal.
- Formal Proof Verification Program: Developed Java script that confirmed whether a proof was correct.

University of California, San Diego, Dept. of Family and Preventive Medicine

Clinical Research Intern (5/2011 - 8/2011)

Supervisor: Dr. Hillary Klonoff-Cohen, Professor and Director of Post-Doctoral Cancer Disparities Program, UCSD John and Rebecca Moores Cancer Center (*currently at University of Illinois, Champagne-Urbana*; (858) 472-0200; klonoffc@illinois.edu)

Specific Duties: Worked on a clinical research project, the purpose of which was to predict the risk of childhood asthma in infants and young children, using two inflammatory markers, urine eosinophil protein X and serum eosinophil cationic protein. Duties included refining the final study protocol, supervising the weekly work schedule, and recruiting young asthmatic and healthy patients and their families into the study at Balboa Naval Medical Center. Recruitment consisted of explaining the study, obtaining informed written consent, assisting nurses with infant/youth specimen collection, transportation, and storage, and scheduling and completing follow-up

appointments. The internship also consisted of shadowing the Head of Pediatric Pulmonology in order to view other rare pulmonary diseases.

PUBLICATIONS

- Bench, M.L., Vredenburg, M.J., Zackowitz, I.B. & Vredenburg, A.G. (2017). An epidemiological perspective of individual and population health risk prevention. Pedro Arezes (ed.), In *Advances in Safety Management and Human Factors*, (pp. 357-368). Warsaw, Poland: Springer International Publishing.
- Bench, M.L., Vredenburg, M.J., Zackowitz, I.B. & Vredenburg, A.G. (2017). Risk Communication for Consumer Products. Pedro Arezes (ed.), In *Advances in Safety Management and Human Factors*, (pp. 225-235). Warsaw, Poland: Springer International Publishing.
- Zackowitz, I.B. Vredenburg, M.J., Bench, M.L., & Vredenburg, A.G. (2017). Types of Consumer Products. In G. Emilien, R. Weitkumat & Ludicke (Eds.). *Consumer Perception of Product Risks and Benefits*. (pp. 3-22). Switzerland: Springer.
- Vredenburg, M.J., Zackowitz, I.B., Spencer, D., DeTaboada, M.R., & Vredenburg, A.G. (2010). What constitutes typical adolescent behavior and how does it differ from adult conduct? In Gavriel Salvendy & Waldemar Karwowski (Eds.). *Advances in Human Factors, Ergonomics, and Safety in Manufacturing and Service Industries*. (pp. 927-936). Boca Raton, FL: CRC Press.
- Vredenburg, M.J. (2009). Public Health: An Epidemiological Study to Explore the Relationship between Literacy, Language, Aging, and Familiarity on Comprehension of Health Information. In *Proceedings of the Human Factors and Ergonomics Society*. (pp. 744 – 748). Santa Monica, CA: Human Factors and Ergonomics Society.
- Vredenburg, M.J., Kalsher, M. & Vredenburg, A. (2006). Adolescent risk perception and self-protective behavior regarding airsoft and paintball Guns. *IEA2006: 16th World Congress on Ergonomics*. Elsevier Ltd.

PRESENTATIONS

- *Risk Communication for Consumer Products*. Presented at the AHFE 2017 International conference on safety management and human factors, Los Angeles, California, July 20, 2017.
- *What constitutes typical adolescent behavior and how does it differ from adult conduct?* Presented at the AHFE 2010 International Conference on Applied Human Factors and Ergonomics, Miami, Florida, July 19, 2010.
- *Adolescent risk perception and self-protective behavior regarding airsoft and paintball Guns*. Presented at the IEA2006: 16th World Congress on Ergonomics, Maastricht, Netherlands, July 13, 2006.
- *Patient Safety: Testing the effectiveness of patient medication information sheets in communicating pharmaceutical risk*. Invited presentation to the physicians at Kaiser Permanente (Zion), San Diego, CA, August 22, 2007.
- *Patient Safety: Testing the effectiveness of patient medication information sheets in communicating pharmaceutical risk*. Invited presentation to the San Diego Association for Rational Inquiry, San Diego, CA, April 22, 2007.
- *Wastewater Treatment: Evaluating the effectiveness of real-time surrogate measures*. Invited presentation at the San Diego Oceans Foundation awards dinner regarding improving ocean water quality; San Diego Oceans Foundation Award winner and Sea World scholarship recipient. San Diego, CA, September 27, 2008.
- *Evaluating the Effectiveness of Real-time Surrogate Measures of BOD in the Waste water of Fruit Processing Plants*. Invited presentation to the San Diego Association for Rational Inquiry, San Diego, CA, April 27, 2008.
- *Waste water Treatment: Evaluating the effectiveness of real-time surrogate measures*. Invited presentation to the San Diego Water Authority, San Diego, CA, April 24, 2008.
- *Patient Safety: An Analytic, Epidemiological Study to Explore the Relationship between Literacy, Language, Aging, and Familiarity on Comprehension of Health Information*. Invited presentation to the San Diego Association for Rational Inquiry. April 26, 2009.
- *Patient Safety: An Analytic, Epidemiological Study*. Invited presentation to the San Diego Human Factors and Ergonomics Society. June 15, 2009.
- *Public Health: An Epidemiological Study to Explore the Relationship between Literacy, Language, Aging, and Familiarity on Comprehension of Health Information*. Presented to the Human Factors and Ergonomics Society 53rd Annual Meeting San Antonio, Texas: Human Factors and Ergonomics Society, October 23, 2009.

COMPUTER COURSES AND LANGUAGES

Animations

- Knows a variety of animation software programs to meet the needs of the project
- Created promotional animation video for the Greater San Diego Science and Engineering Fair, screened at San Diego State University's Viejas Arena
- Demonstrated the mathematics behind polar decomposition in continuum mechanics via animation

Courses

- Efficient Algorithms and Intractable Problems
- Data Structures
- Discrete Mathematics and Probability Theory (Included a coding component of the class: wrote and ran virtual experiments to reinforce concepts of the class)
- Introduction to Computer Programming for Scientists and Engineers

Languages

- Java, Python, Matlab, Ruby
- HTML, CSS, Javascript

VOLUNTEER, LEADERSHIP and SERVICE PROJECTS

- Chaired the technical session, "Risk Prevention and Assessment." AHFE 2017 International conference on safety management and human factors, Los Angeles, California (July 20, 2017).
- Founding President of Delta Sigma Phi fraternity at UCB. Was responsible for recruiting, running meetings, acquiring real estate, and hosting and attending leadership training.
- Executive Director, Pacific BookShare. Collected books and school materials for Developing countries. Traveled to Samoa to establish a library (dedicated 6/20/08); gave motivational speech regarding education and literacy.
- Co-Chair, Student Advisory Board (Honor Society) Greater San Diego Science and Engineering Fair (member 2006-2009; elected co-chair for 2009-2010). Ran annual regional science fair. Helped schools set up science fairs.

ACADEMIC HONORS AND AWARDS

Science

- International Science and Engineering Fair (ISEF, 2010) Fourth Place.
- California State Science Fair (2010): Fourth place. Greater San Diego Science and Engineering Fair (2010). First place and Intel ISEF trip Sweepstakes winner and scholarship recipient. Project title: *Pharmaceutical Safety: Risk perception and drug adherence*. This research was also honored and recognized by: San Diego Society of Health-Systems Pharmacists, Human Factors & Ergonomics Society
- Young Epidemiology Scholars (2009). Regional Finalist and \$2,000 scholarship recipient. Invited to compete in Washington DC in National Competition. California State Science Fair (2009): Fourth place. Greater San Diego Science and Engineering Fair (2009): First place and runner up for Sweepstakes Award. Project title: *Public Health and Safety: An Analytic, Epidemiological Study to Explore the Relationship between Literacy, Language, Aging, and Familiarity on Comprehension of Health Information*.
- California State Science Fair (2007): First place. Greater San Diego Science and Engineering Fair (2007): First place and runner up for Sweepstakes Award. Project title: *Patient Safety: Testing the effectiveness of patient medication information sheets in communicating pharmaceutical risk*. This research was also honored and recognized by: Kaiser Permanente. Award for Excellence in Health Care Sciences.
- California State Science Fair (2006): First place. Greater San Diego Science and Engineering Fair (2006): First place. Nominated for the Discovery Channel Young Scientists Challenge. Project title: *Eye Injuries: Adolescent Perceptions and Self-Protective Behaviors Concerning Recreational Guns*.

Essays

- Ethics in Science essay competition. Third place (2010). Title: Ethical Concerns Regarding Risk Communication of Pharmaceutical Safety Information. Awarded by the Center for Ethics in Science and Technology (an independent center affiliated with UC San Diego, University of San Diego, and San Diego State University).
- Recipient of the 2010 Civil Liberties in Science & Technology Award. Essay title: Risk Perception and Drug Adherence.
- Ethics in Science essay competition. First place (2009). Title: Ethical Concerns Regarding Patient Access to Critical Health Information. Awarded by the Center for Ethics in Science and Technology (an independent center affiliated with UC San Diego, University of San Diego, and San Diego State University).

PERSONAL

- Competed on the NBC *I vs. 100* "Child Genius" show (Jan 10, 2007).

- Developing new bioengineering technologies in large scale research project in Shasta (CA), to help people living in regions that lack infrastructure.