



# Vredenburgh & Associates, Inc.

Human Factors, Safety, Biomechanics and Organizational Consulting

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## MICHAEL JOSEPH VREDENBURGH Curriculum Vitae

### CURRENT POSITION

#### **Vredenburgh & Associates, Inc.**

Biomechanics and Human Factors Engineering Consultant, (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 HF engineering consultant for product liability and personal injury cases. Performs site inspections, analyses and laboratory testing. Conducts original research, publishes in peer-reviewed publication, and presents at scientific conferences. Expertise in adolescent safety and expected behavior.

### EDUCATION

#### **Wright State University**

Ph.D. Industrial and Human Factors Engineering (2019-present)

#### **University of California, Berkeley**

B.S. Bioengineering (2016)

#### **University of California, San Diego**

Dept. of Family and Preventive Medicine, Clinical Research Intern (Summer, 2011)

Worked on a clinical research project 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 explaining the study, obtaining informed written consent, assisting nurses with infant/youth specimen collection.

### PUBLICATIONS

Vredenburgh, A. & Vredenburgh, M. (*in press*). Human Factors Analysis of a Rotating Restaurant. In *Proceedings of the Human Factors and Ergonomics Society 2020 Annual Meeting*, Santa Monica, CA: Human Factors and Ergonomics Society.

- Borzendowski, S., Vredenburg, M., Darlson, C., Hersh, M., Vredenburg, A., & Zackowitz, I. (2019). Children's safety workshop: A demonstration of human factors professionals' preparation with practicing attorneys. In *Proceedings of the Human Factors and Ergonomics Society 2019 Annual Meeting*, Santa Monica, CA: Human Factors and Ergonomics Society, 227.
- Vredenburg, M.J., Bench, M.L., Zackowitz, I.B., Runge, K., & Vredenburg, A.G. (2018). Amusement Park Guest Injured on a Water Ride: A Human Factors and Biomechanics Evaluation. In *Proceedings of the Human Factors and Ergonomics Society 2018 Annual Meeting*, Santa Monica, CA: Human Factors and Ergonomics Society, 440-444.
- Vredenburg, M.J., Bench, M.L. (2018). Why We Withdrew from Our First Forensics Case. In *Proceedings of the Human Factors and Ergonomics Society 2018 Annual Meeting*, Santa Monica, CA: Human Factors and Ergonomics Society, 416-420.
- 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. Weitkunat & 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

- Children's safety workshop: A demonstration of human factors professionals' preparation with practicing attorneys. (Chair). Seattle, WA: Human Factors and Ergonomics Society, October 30, 2019.
- *Amusement Park Guest Injured on a Water Ride: A Human Factors and Biomechanics Evaluation*. Presented at the Human Factors and Ergonomics Society 2018 Annual Meeting, Philadelphia, PA: October 3, 2018.
- *Why We Withdrew from Our First Forensics Case*. Presented at the Human Factors and Ergonomics Society 2018 Annual Meeting, Philadelphia, PA.: October 2, 2018.
- *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.
- *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.
- *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: 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.
- *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.

## ACADEMIC HONORS AND SCIENCE AWARDS

- 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*.

## **VOLUNTEER, LEADERSHIP and SERVICE PROJECTS**

- Elected Secretary/treasurer, Forensics Professional Group, Human Factors & Ergonomics Society (2020-2022).
- 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.

## **COMPUTER PROJECTS AND LANGUAGES**

### **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.

### **Languages**

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