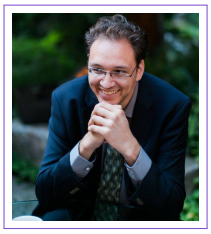

Hani Awni

Biotechnologist & Roboticist

Education

2015–2017 **BS: Electrical Engineering**, *Univ. of Illinois*, Urbana, IL, *GPA – 3.6*.
Focused on control theory, biomechanics, and robotics. Participated in the Engineering & Social Justice Scholars Program and advocated for socially-conscious STEM education.

2009–2013 **BS: Brain-Machine Interfacing (CS)**, *Univ. of Illinois*, Urbana, IL, *GPA – 3.2*.
Expanded computer science major with deep background in cognitive science, neuroscience, and signal processing. Third custom degree ever awarded by Engineering College.

Classes

2015-2017 Control Theory, State Space Control, Neuromuscular Modeling, Embedded Systems, Biomedical Imaging, Robotics, Engineering & Social Justice, Signal Processing

2009-2013 Neural Network Modeling, Cognitive Psychology, EEG Experiment Design, Computational Neuroethology, Machine Learning, Database Systems, Program Verification

Research

Title *Towards A Brain Computer Interface Based on the N2PC Event Related Potential.*

Authors/Year Hani Awni, J. Norton, S. Umunna, Dr. K. Federmeier, and Dr. T. Bretl. 2012-2013

Description Demonstrates feasibility of an EEG-driven BCI of my own design, based on the heretofore unused N2pc event related potential. Unlike the more common P300Spellers or SSVEP-Spellers, this BCI does not involve a flashing interface, thus improving comfort for extended use. 1st Senior thesis. Presented at IEEE EMBS NER 2013.

Title *Biomechanically-Valid Motion Capture despite Occlusion using Kinects and IMUs.*

Authors/Year Hani Awni, D. Douglass, Dr. R. Ratnam. 2016-2017 (In Progress)

Description Demonstrates localizing realistic human musculoskeletal model throughout a motion despite occlusion from multiple Kinects and IMUs, in order to predict fall risk of the elderly during ecologically-valid routine motions. 2nd Senior thesis.

Title *Open-Source Simulink Model of Planar Arm Motion for Real-Time Control.*

Authors/Year Hani Awni, Dr. M. Hernandez. 2016 (Available by Request)

Description Implemented and documented 2 DOF Simulink model for planar arm motion with realistic muscle behavior. Superior to formerly-used OpenSIM models due to differentiable & discontinuity-free muscle lengths across entire range of motion.

14105 Edgewater Ct. – Libertyville, Illinois 60048
(224) 715 5995 • hani.awni@gmail.com
haniawni.github.io/resume

Experience

Vocational

05/2016–08/2016 **EEG Data Analyst**, DAQRI, Los Angeles, CA.

- Invented 4 ERP-driven applications for Augmented Reality interactions. Co-invented additional 2 as second author. Currently in preparation for patent app submission.
- Constructed labratory-grade real-time EEG recording, streaming, and analysis stack.
- Design and implement interface between the OpenBCI NodeJS library and SCCN's LabStreamingLayer to enable multidevice synchronization and BCILAB-driven analytics using the low-cost OpenBCI EEG device.
- Research, analyze and interpret sleeping EEG data using Python's SciPy library.

01/2014–05/2015 **Solo Neuroengineer & House Captain**, SELF-EMPLOYED, San Francisco, CA.

- Helped direct the setup and growth of a 25-person intentional community focused in interdisciplinary intellectual interchange in San Francisco.
- Resolved or mediated inter-resident conflicts pursuant to overarching community goals.
- Worked on myriad neuroengineering projects, including Moodband, a wearable for EEG-based emotional state visualization; ley*, a MFQ-scheduler-inspired to-do system; Respectable, a social-graph analysis tool; and an Abalone AI competition.
- Self-taught and took online courses in chaos, complexity theory, and medical neuroscience.
- Researched possible BCIs and wearables, especially in the contexts of potential game designs, mental health, biological robots, and behavioral reinforcement.

Lab Experience

08/2016–Present **Researcher**, DR. RATNAM'S HEALTHCARE ENGINEERING LAB, Urbana, IL.

- Created & used recording software in small team to capture elderly subjects in realistic apartment environments despite occlusion.
- Created analysis pipeline to estimate realistic biomechanically-valid body motion from noisy Kinects, force sensors, and IMUs.
- Collaborated across numerous disciplines and institutions, including Dr. Sosnoff's Fall Prevention Lab and the Jump Trading Medical Simulation Center in Peoria.

01/2011–05/2013, 05/2015–05/2016 **Research Engineer**, DR. HUMMEL'S COGNITIVE MODELING LAB, Urbana, IL.

- Expanded LISA model of human abstract reasoning to better reason about complex situations and develop doubt in hypothetical situations using analogies.
- Designed & implemented experiment interfaces and structure to best test working theories of relational visual perception, attention, and memory.
- Aided Phd. students in coding, data analysis, and interpretation of relevant theories.

08/2012–05/2013 **BCI Researcher**, DR. BRETL'S APPLIED CONTROLS LAB, Urbana, IL.

- Researched and implemented novel EEG Brain-Computer Interface, the N2PCSpeller.
- Recruited and ran subjects to collect data to test and optimize N2PCSpeller.

Service

08/2016–12/2016 **STEM Outreach Facilitator**, UI:CHICAGO, Chicago, IL.

- Taught 8th graders from Chicago Public Schools how to use MIT's Scratch visual programming language to empower students for future possible STEM careers.
- Established rapport with a small handful of 8th graders despite differing backgrounds to make college less intimidating and foreign.
- Introduced several advanced students to more powerful programming environments like NetLogo and demonstrated modeling animal behavior with their current capabilities.

11/2014– Present **Visiting Lecturer & Panelist**, Libertyville High School, Libertyville, IL.

- 3+ times per year, presented to multiple AP CS classes in Libertyville to demystify post-high-school life in light of industry life.
- Clarified the breadth of CS subfields, overviewed engineering majors, and characterized variety & vitality of various STEM industries and careers.
- Answered questions from current high schoolers about their futures and abolished common myths about life, emotional vulnerability, social connection, metal health, and adulthood.

Skills

Basics LaTeX, Windows, Mac OSX, Ubuntu, Unity Engine, Office Suite, Git

Programming Python, C, JavaScript/NodeJS, Matlab, Java, C++, Ocaml, NetLogo, Mathematica, SQL

Frameworks ROS, Simulink, PEG, Google App Engine, Jupyter Notebooks, LabStreamingLayer

Partial Projects List

10/2016–Present **Open Repository of Social-Justice-Focused Senior Design Project Proposals for CS & ECE**, *Hani Awni*.

Undergraduate engineering education currently fails to grow the requisite critical thinking, reflection, and theory necessary to facilitate socially-conscious project definition, even among those students inclined to address societal ills rather than 'sexy' tech capabilities. This ever-growing repository of example project proposals tackling issues of social justice provides realistic, undeniably-implementable technical proposals addressing problems commonly deemed a-priori a "social problem" by the tech community. Project proposals are intended to encourage design thinking, empower budding engineers to tackle classically 'off-limits' problems like online harassment, doxxing, or astroturfing, and demonstrate to the existing technical community how reasonably addressable these problems are in reality.

Status Ongoing. Accumulating project proposals & establishing collaborations with UIUC ECE and CS departments.

01/2017–Present **'Twelve Thousand Years of STEM' Display**, *Hani Awni & Cheyenne Syring*.

Challenges eurocentric narratives of science, technology, and engineering that purport science "began in the Age of Enlightenment" by highlighting the multitudes of non-western pre-existing or ongoing scientific and technological developments across many domains of science and engineering. Will take the form of multiple-poster display situated in a highly-visible semi-permanent installation directly outside of the main Engineering Department advising center in UIUC's Engineering Hall .

Status Ongoing. Research and poster design underway.

04/2014–Present **Automating Around Undesired Mental Illness Symptoms**, *Hani Awni*.

Circumvents numerous unwanted symptoms of mental illness, including impaired executive functioning due to depression and ADHD, difficulty initiating day due to depression, difficulty maintaining social bonds, and difficulty forming narratives of personal productivity in the form of a digital personal assistant allowing hierarchical project definition & tracking inspired by GSD productivity methodology. Semiautomatically reduces entire library of tasks consituting projects, in light of current priorities and available time and context, into current task for immediate execution while forcing focus.

Status Ongoing. Basic project/task tracking implemented, currently implementing automation.

08/2015 - 12/2015 **Low Cost MicroUAVs: Off-the-Shelf Remote-Control Beetles**, *Hani Awni*.

Adapts the Maharbiz lab's work with Jade Flowering beetles as RC UAVs to work with off-the-shelf microcontrollers and radios. Uses ATTiny microcontroller and HM11 BLE module to substantially reduce electronics cost to less than $\$0.25$ per beetle by scaling up the beetle to carry the heavier payload. Needs Hercules, Atlas, or Goliath beetles or similar.

Status Paused. Electronics/Firmware complete, yet testing delayed pending access to large beetles and lab. Will resume if I ever live in Southeast Asia.