Corten Clemente Singer

cortensinger@berkeley.edu • 619 993-5598
https://cortensinger.github.io • github.com/cortensinger

Education

Point Loma High School *2009 – 2012*
- Graduated Valedictorian

University of California, Berkeley
- Regents' and Chancellor's Scholar *2012 – 2017*
- B.A. Computer Science // B.A. Cognitive Science
  + *Graduation Honors:* Distinction in Outstanding Undergraduate Research & Innovation
- M.S. Electrical Engineering & Computer Science *2017 – 2018*

Qualifications

Awards: 2017 Lemelson-MIT $10k Student Prize, 1st Place Invention in "Drive It!" Category
1st Place Hack at Hack For Humanity 2016 • Fusion 360 Design Award at TOM:Berkeley 2017

Language: Spanish (5+ years and semester abroad at La Universidad de Chile)

Technical Skills:
- CAD, Rapid Prototyping, Embedded Systems, 3D Printer, Laser Cutter, Soldering, PCB Mills
- *Software:* C, C#, Python, Git, Arduino & Arduino-like MCUs, Processing, Fusion360, Rhino
- *Eye Tracking:* Tobii, Pupil Labs - *Wheelchairs:* Permobil IOM/OMNI/RNET, LiDAR Sensing
- *Familiar with:* JavaScript, Java, HTML/CSS, Apache Spark, OpenMP, Adobe, JTAG, TMS, fMRI

Experience

Computer Science Lab Assistant for CS 61AS: Intro to Programming *Spring 2014*
Computer Science Lab Assistant and Tutor for CS 61C: Computer Architecture *2015 – 2016*
Research Assistant: Walker Lab, Sleep Deprivation & Pain Sensation (EEG) *Fall 2015*
Research Assistant: D'esposito Lab, Cortical Attention Areas (fMRI, TMS) *Spring 2016*
Qualcomm SW Intern: Linux OS Networking Device Driver (C, JTAG, Perl) *Summer 2016*
Undergraduate Research: Human-Computer Interaction under Eric Paulos & Björn Hartmann *2016 – 2017*
Microsoft Research Intern: Enable Research Team, Eye-Gaze controlled motorized wheelchairs for users living with ALS (Tobii eye tracker, RNET, Permobil) *Summer 2017*
Graduate Student Instructor for DESINV22: Prototyping & Fabrication *Fall 2017*
Graduate Research: HCI thesis under B. Hartmann, SeeThru: Towards Minimally Obstructive Eye-Controlled Wheelchair Interfaces *2017 – 2018*

Projects

aliviaRÁ: Won first place at the Hack For Humanity hackathon at UC Berkeley. Smart wearable glove with on-board BLE-enabled MCU, 5 flex sensors & 3 coin motors. Real-time iOS app displays therapeutic finger-movement exercises and live feedback. Heroku server analyzes finger data and maintains detailed reports over time. *Spring '16*

WheelSense: Low-cost, open-source, power wheelchair add-on system that gives users with vision impairment the independence to explore unfamiliar terrain. Consists of a sensor suite of multiple infrared and ultrasound rangefinders to detect obstacles such as steps & drop-offs, ramp edges and objects behind the chair. Haptic and auditory feedback. Arduino. *Fall '16*

SmartWheels: A self-driving, target-following, obstacle-avoiding mechanized wheelchair. Built with a Raspberry Pi 3 Model B with a PiCAN 2 shield to send commands to the wheelchair via the RNET protocol. An iOS app is used to track an AprilTag with its camera and send data to the RasPi via UDP. Ultrasonic sensors detect obstacles. *Fall '16*

ReOrient: Medical device design collaboration with UCSF Medical Center to help reduce and prevent hospital-induced delirium in their patients via non-pharmacological interventions (analyzes motion, sound and light levels to notice irregularities in room). Device speaks to a web app via wifi-enabled Particle Photon MCU. Sensor fusion. *Fall '16*

SmartHouse: Won the Fusion360 Design Award at TOM:Berkeley Assistive Tech Make-a-thon. Designed for quadriplegic friend who controls his wheelchair/tablet using a mouth-based joystick. Windows app speaks to wifi-enabled Particle Photon to control OpenSesame door-opener & other appliances. Developed custom tablet mount and low-cost joystick with EMG clicker for bedside use. *Spring '17*

Pilot37: Worked with MSR+TeamGleason to create world's first eye-controlled Radio Control (RC) car. Main goal: Enable Steve Gleason, (ALS/NFL icon), to play with his son from his wheelchair. Prototyped an eye-tracking user interface that drives an RC car via Bluetooth from a Windows UWP app, which displays live POV video stream of the car overlaid with gaze-enabled controls. *Summer '17*

SeeThru: Developed 2 screen-free gaze-enabled wheelchair interface prototypes built with a desktop eye-tracker (Tobii 4C) & a head-mounted one (Pupil Labs). Main goal: Decouple the use of mobile eye-tracking technology from the need of obstructive/disorienting digital screen displays. *2017 – 2018*

Relevant Coursework

- Data Structures + Algorithms {*Java*} • Introduction to Microelectronic Circuits {*Multisim*}
- Computer Architecture (Machine Structures) {*C, MIPS, Spark, Logosim*} • Operating Systems {*C* }
- Cognitive Neuroscience • Computational Models of Cognition {*NumPy*} • Human-Comp. Interfaces
- Efficient Algorithms & Intractable Problems • Computational Design & Fabrication {*Rhino, Python*}
- Interactive Device Design {*Particle Photon, Fusion 360, Eagle*} • Embedded Systems {*C, LabVIEW*}
- Reimagining Mobility: Design Research & Prototyping • Algorithmic Human-Robot Interaction
- Mechatronics Design Lab {*C, Eagle, Fusion 360*} • Critical Making {*Arduino, Processing, Eagle*}