Alex Patin

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Education

Pennsylvania State University Class of 2018: B.S. Computer Science, Mathematics Minor **Major GPA:** (3.81/4.00)

Relevant Courses: Data Structures & Algorithms, Systems Programming, OOP (Java), Discrete Math, Computer Organization & Design

Experience

Musical Minds: *CEO, Founder, Software Developer* **December 2015 - Present**

- Oversaw 10 employees in the development of Brain-Computer Interface headphones for applications with music therapy
- Outlined testing protocols, milestones, a business plan, and research procedures with our board of directors
- Designed reinforcement learning models and EEG signal classifier models to relate positive neural responses to certain song traits
- Created Windows, iOS, and Android SDKs for interfacing with ASIC modules and EEG sensors through Bluetooth
- Participated in the filming of a second "Alive Inside" documentary on music therapy for elders with dementia

Microsoft: *Student Partner* **August 2015 - Present**

- Organized 8 workshops for college students on developer tools including OpenCV, Kinect, Azure, Android, Microsoft Band, etc.
- Represented Microsoft as a sponsor at 2 Health Hackathons to promote the Microsoft Band with related workshops
- Volunteered at middle and high schools to teach programming concepts through Kinect programming

Progeny Systems: *Software Engineering Intern* **May 2015 - August 2015**

- Programmed web-scraping software in Python for collection of images and associated data from Facebook
- Implemented scraping software on Amazon EC-2 instances to acquire a 3,000,000+ person dataset
- Designed an interactive GUI in Java to represent facial feature similarity adjacency matrices visualized using t-SNE for clustering

Projects

Lunar Lion (First Collegiate Lunar Lander)**:** *Guidance, Navigation, and Controls Lead Engineer* **December 2015 – March 2016**

- Directed 35 students in the development of five software/hardware subsystems including flight software, ground controls, modelling and controls, systems testing, and visual guidance
- Interfaced the craft's health monitoring, navigational, and communication sensors with C/C++/Python software using Arduinos and RTD controllers running Linux

Lunar Lion Visual Guidance System: *Lead Engineer* **April 2015 – January 2016**

- Pioneered first 3D topographical reconstruction system to use a single camera with OpenCV in C++
- Implemented a spline interpolation algorithm using parallax models from trackable objects on the lunar surface
- Applied topographical reconstruction system to risk analysis algorithm for landing sequence adjustments

Intelli-DJ: *Team Leader and Developer* **November 2015**

- Spearheaded research on using neural networks to identify emotions using polygraph readings
- Designed Android app with the Spotify SDK and API to use Microsoft Band 2 sensors as a modified polygraph for reinforcement learning of a user's taste in music based on their current physical state

Lysdexia: *Team Leader and Developer* **March 2015**

- Spearheaded research on common treatment methods for dyslexia and other literacy impairments in children
- Designed 4 interactive Xbox Kinect minigames each designed to improve specific literacy skills

"Speaker Verification using Spectral Frequency Analysis": *Developer and Researcher* **October 2014 - March 2014**

- Developed FFT-based software to analyze a speaker's spectrogram and identifiy the speaker in a dataset
- Conducted tests with 80% accuracy on a dataset of 40 people.

Awards and Achievements

- **Penn State Erickson Grant Recipient** **April 2016**
- **1st Place at HackPSU** - Intelli-DJ **November 2015**
- **Penn State Engaged Scholarship Award** **November 2015**
- **Leonard Center Speech Contest for Engineers Semifinalist –** Harnessing DNA for Digital Storage **April 2015**
- **American Math Competition Senior Champion** **June 2014**

Software Skills

Languages: C **/** C++ **/** C# **/** Objective-C, Java, Python, Swift, Javascript **/** Node.js, HTML, CSS

Frameworks/Platforms/Libraries: Azure, AWS, .NET, REST, OpenCV, GraphStream, TensorFlow, Numpy, SciKit, Selenium/BeautifulSoup

Algorithm Proficiencies: FFT, t-SNE, Neural Nets, Reinforcement Learning, Spline Interpolation, Kalman Filtering, Web Scraping