Lukas José Ferrer

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ABOUT ME

I studied Bio, EE, and AI to see neurons from all three perspectives. My initial work on electrophysiology, medical devices, and VR gave me experience bringing research into reality. As a self taught programmer, I now focus on Deep Learning and NLP applied towards Information Retrieval Systems.

EDUCATION

M.S. BIOMEDICAL ENG.
USC | Viterbi
August 2017 | Los Angeles, CA
Focus: Electrophysiology,
Medical Signal Processing,
& Agile Software Development

B.S. BIOMEDICAL ENG.
USC | Viterbi
May 2016 | Los Angeles, CA
Focus: Medical Devices
& Physiological Modeling

TOOLS

PYTHON
PyTorch | FastAI
TensorFlow | Keras
TensorBoard
Numpy
SpaCy
Faiss
REST | Requests

SOFTWARE
Linux | Ubuntu | CentOS
Amazon Web Services
Docker
MATLAB
LabVIEW
SolidWorks

LINKS

LinkedIn || lukas-ferrer
Live Demo || ResearchTool
Backend || DIG-Text-Similarity-Search
GitHub || Ljferrer

EXPERIENCE

INFORMATION SCIENCES INSTITUTE | Research Programmer
May 2018 – Present | Marina del Rey, CA
- **SARAL** – Working with Transformers for low resource machine translation
- Reimplemented several academic papers in PyTorch
- Improved our existing NMT system's performance by 1.5 BLEU by incorporating Stochastic Depth to train a 50% deeper model
- Operationalized our models to fit into the larger SARAL pipeline i.e. Audio/Text Database –> ASR –> *NMT* –> IR –> Summarization –> User
- **SAGE** – Implemented the backend of SAGE's in-house **Research Tool**, a news database that uses sentence embeddings made with TensorFlow, finds nearest neighboring hits with Faiss, and is deployed as a Restful API
- Set up a host server on AWS and automated the ingestion pipeline that continuously updates the Research Tool with +100,000 news articles per day from LexisNexis

KECK RADIOMICS LAB | Volunteer Researcher
Oct 2016 – Nov 2017 | Los Angeles, CA
- Analyzed spectral and texture features of CT images with a particular focus on boundary conditions for tissue segmentation in a HIPAA compliant setting
- Characterized the statistical variance of images across different CT machines

BRAIN-MONITORING DEFIBRILLATOR | Final Project
Sept 2016 – Dec 2016 | USC BME 620
- Proposed the design of an implantable Class III medical device that monitors brain activity to accurately determine when a patient with extreme cardiovascular risk is in need of defibrillation
- Identified a less invasive alternative to increase the patient's quality of life and charted *this* hypothetical path to market through the FDA instead

RECALL VR | Creator and Team Lead
Aug 2015 – May 2016 | USC GamePipe Lab
- Envisioned and pursued the creation of an experimental, Virtual Reality learning accelerator designed to leverage a student's natural spatial awareness to increase memory retention (sometimes called The Memory Palace Technique)
- Led 16+ students with skill sets ranging from architecture and animation to computer science and business under an Agile development framework
- Won 1st place at the 2016 Viterbi Senior Design Expo
- Declined several investment opportunities to create a VR Education startup
- Ultimately, the experience drove me to teach myself Machine Learning & AI

HEMODIALYSIS CATHETER | Final Project
May 2015 – Aug 2015 | USC MPTX 513
- Designed a novel Class II implantable medical device for a faux-510(k) to simulate the process of obtaining FDA clearance to market

SYNTOUCH | Robotics Intern
Feb 2014 – Nov 2014 | Los Angeles, CA
- Fabricated a robotic test fixture to explore alternative applications of SynTouch's new tactile sensor, the NumaTac
- Reported weekly progress at the Medical Device Development & Fabrication Lab at USC under the direction of Dr. Gerald E. Loeb