Manuel Illanes

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I consider myself a learning enthusiast and I want to contribute to the development of practical applications of neurotechnology. I have training as a Data Scientist and Neuropsychology Research with Brain-Computer Interfaces. I'm very interested in how the brain works and how technologies like Machine Learning and XR will accelerate the future.

SKILLS

Programming Languages: Python, C#, C++, R, JavaScript, Matlab/Octave, HTML/CSS.

Database: SQL, MySQL, Neo4J, MongoDB.

Frameworks and Tools: Unity, Tensorflow, Pytorch, Keras, EdgeImpulse, TinyML, ONNX, Pandas, Numpy, ScikitLearn, OpenCV, Mediapipe, GIT, OpenAIGym, Stable-Baselines3.

Cloud Computing: Intermediate: GCP, Azure, IBM Cloud, Docker.

Languages: English - Fluent; Spanish - Native.

EDUCATION

MSc Data Science, Bolivian Catholic University *Present - Estimated end date: Dic 2022*

Bachelor in Psychology, Bolivian Catholic University Magna Cum Laude, *Sep 2019*

PROFESSIONAL CERTIFICATIONS

Computational Neuroscience, Neuromatch Academy - Jul 2021

Scientific & Engineering Principles of Adaptive Neurotechnologies, NCAN - Jul 2021

Neuroscience and Neuroimaging Specialization, Coursera - Duke University Oct 2020

AI for Medicine Specialization, Coursera - deeplearning.ai Nov 2020

Specialization in Neuroscience Research, Cambridge Center for Innovation and Development, UK Oct 2021

Certificate in Machine Learning, Bolivian Catholic University Sep 2020

Certificate in Higher Education, Bolivian Catholic University Sep 2020

PROFESSIONAL EXPERIENCE

Neuromatch Academy - **Teacher Assistant Computational Neuroscience Course -** Jul 2022 - Aug 2022

● Main topics covered during the summer school of 2022 include Machine Learning, Deep Learning, Reinforcement Learning, Dynamical Systems, Network Causality, and theoretical models in Neuroscience. ● Python frameworks used: PyTorch, Scikit-Learn, Numpy, Scipy.

Neurable - Analytics Intern - May 2022 - Sept 2022

● Applied Signal Processing and Machine Learning methods to develop a state-of-the-art BCI system with EEG biosignals. ● Software development of the internal experiment platform using Unity. ● Assist in the development of experimental protocols for brain-computer interfaces.

Neurode - Software Developer - April 2022 - Present

● Developed behavioral tasks to measure attentional deficits in ADHD patients ● Combined fNIRS data acquisition with behavioral tasks. ● Used the Flutter ecosystem to deploy multiplatform apps. ● Unity engine used for task development.

Elemental School - Unity Instructor *Nov 2021 - Present*

● I am the instructor of a course directed at teaching Programming and Game Development using Blender3D and the Unity Engine. ● I designed the curriculum "Unity for Kids" and "Unity for Teens", and I have taught |more than 40 students so far.

Cambridge Center for Innovation and Development - Research Internship - May - Oct 2021

● Elaborated research review focused on patients with Spinal Cord Injury and Virtual Reality for the retraining of somatosensory feedback.

Bolivian Catholic University - Associate Researcher - *January 2021 - Present*

● Conducted experimental research in the field of affective computing and neurophysiology. ● Collected and analyzed data from experiments and elaborate reports. ● Manage grant resources for new lab hardware for

projects. ● Developed systems for data acquisition on PC and Virtual Reality. ● Coordinate interdisciplinary student internship at the lab. ● Taught classes on Machine Learning and Digital Signal Processing for Biosignals.

University of Jaén - Research Assistant March 2019 - June 2019

● Assisted with designing experiments, collection of data, and organizing lab tasks to work with electrophysiology on human subjects collecting data from EMG, EEG, ECG, fNIRS, RESP, and VR to study affective responses to audio-visual stimuli.

Departmental Institute for Child Adaptation and the Foster Home, Méndez Arcos Center - Clinical Child Neuropsychology - June 2018

● Assisted medical staff with neuropsychological evaluations ● Assisted intervention to children in special foster homes with neurological conditions. ● Designed and administered neuropsychological batteries to families from low-income neighborhoods.

PROJECTS

Reboot 1st Place Winner - Hackathon Brain-Computer Interfaces "NatHacks" - Research Track. Canada, Alberta. 2021. Direct support for most of the consumer-ready EEG devices available in the market.

Brain Tumor Classification with CNN's A desktop tool to test different models of classification of fMRI scans using Unity. **Tech-Stack:** Unity, C#, Tensorflow, ONNX, Numpy, Scipy, Keras.

Delta EEG A low-cost EEG device developed from the ground to help students and hackers have access to record brain waves using accessible open-source technology. **Tech-Stack:** Proteus, Python, Blender,

BCI-Asteroids A Serious Game that uses SSVEP for attention training with Brain-Computer Interfaces. **Tech-Stack:** Unity, C#, Brainflow, Tensorflow, ONNX Runtime.

Pose Estimation for Wushu Training An Artificial Vision System designed to track and estimate the position of different Martial Art movements of Wushu, a traditional martial art. The system is designed to assist people in individual training sessions. **Tech-Stack:** Python, Pandas, Numpy, Mediapipe, OpenCV, GIT, Scikit-Learn.

Neurodiagnostictool A Virtual Reality-based tool for the assessment of common neuropsychological deficits in executive functions using tasks in VR environments. **Tech-Stack:** Unity, C#, Neo4j, OculusSDK.

RESEARCH

An open code pledge for the neuroscience community https://doi.org/10.31222/osf.io/vrwm7

Quality of life-related to compassion, burnout, and caregiver overload in Bolivian nurses https://doi.org/10.21500/19002386.4712

New Tendencies in BCI and Neuralink's Progress https://www.imt.ucb.edu.bo/inertial-free/

Influence of physical fatigue on inhibitory control using HRV and P300. (Under review).

Influence of binaural beats on the levels of virtual reality-induced stress measured by EEG and ECG. (Under review).

Machine learning for the classification of affective states during the use of video games measured through EEG. (Under review).

Empathic perspective taking and pro-social behavior: Experimental evidence of cognitive, affective and social relationships on the decision to share resources linked to HRV. (Under review).

CONFERENCES

2019: "Andean neurosurgeons: pre-hispanic trepanation practices in Bolivia and Perú." National Museum of Ethnography and Folklore (MUSEF).

2019: "Big Data: Instrument of Psychological Warfare". XV Student Conference on Psychology. UCB.

2021: "Introduction to Brain-Computer Interfaces". Conference Day LATAM. Ecuador.

2021: "NeuroTechX: Buzz in Review 2021". Financial Reports of Neurotechnology on 2021. World-virtual.

2021: "The future of Neuroscience: Neurotechnology". XVII Student Conference of Psychology. UCB.

2021: "Workshop: Build your own Neural Network with EdgeImpulse". XVII Student Conference of Psychology. UCB.

2021: "Introduction to Brain-Computer Interfaces". Higher University of San Andres Congress on Psychology.

2021: "Machine Learning for the classification of affective EEG responses". UNAM - Mexico

2022: "Neural Data Science". IEEE Signal Processing Society UCB.

2022: "Neurotechnology: Artificial Intelligence applied to health". Innovation, Technology, and Engineering Congress UCB.

FUNDING

2019: Ideas de proyectos Investigación Universidad Católica Boliviana San Pablo 20.000 Bs

2019. Pequeños proyectos Investigación Universidad Católica Boliviana San Pablo 100.000 Bs