LUIS RIERA

DATA SCIENTIST/ ENGINEER

ABOUT ME

Data Scientist with an ability to manage teams, extract actionable insights from data, engineer systems, and problem solve

TECHNICAL SKILLS

COMPUTER VISION
OpenCV, Human Pose Estimation, Image Processing, Object Detection, Action Recognition, YOLO

DEEP LEARNING
Neural Networks (CNN, RNN, LSTM, Autoencoders), Tensorflow, Keras

MACHINE LEARNING (ML)
Linear Regression, Logistic Regression, Random Forests, Gradient Boosting, Time Series Analysis

PROGRAMMING/SOFTWARE
Python (NumPy, Pandas, Sci-kit Learn, SciPy), C#, C++, Perl, Docker, PySpark, git, GitHub, AWS, CUDA/cuDNN, parallel/distributed computing, Unix/Linux, Windows

WEB/APP DEVELOPMENT
Flask, React, JavaScript, HTML5, CSS

DATA VISUALIZATION
Tableau, Matplotlib, Chart.Js

DATABASE MANAGEMENT
MySQL, PostgreSQL, MongoDB

MANAGEMENT SKILLS

Administrative
Google Analytics, Microsoft Suite, Excel Analytics, Canva, Project and Knowledge-Based Management, Event Planning, Marketing Research, Teaching, Training, and Coaching, Data Analytics, Curriculum Development, Diversity, Equity, and Inclusion, Professional Networking

Language
Spanish Fluent (Written and Verbal)
French Basic

CONTACT DETAILS

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PROJECTS

ATHLETIC COACHING APP - Motion Analsysis
Developed a Flask based computer vision application using OpenCV, Google's MediaPipe, and JavaScript to track performance progress of users. Used Chart.js to display the athlete's joint positions and relevant joint angles predicted from their webcam. Provided visuals showing angular acceleration of key areas as well as knee, hip, and shoulder flexion/extension on the sagittal plane. Achieved ~25fps for real time feedback

- **Tech skills used: Machine Learning, OpenCV, MediaPipe (Google), Python, Flask, SQLAlchemy, SQLite, Data Analysis**

REAL TIME JOINT ANALYSIS - Biomechanical Analysis
Motivated by past injuries, this project aimed to showcase computer vision applied to rehab analysis. Implemented Facebook's VideoPose3D human pose estimator in real time (4 fps). Using live feed from a webcam, displayed joint positions, angles, force and a skeleton overlay. The data provided to the user can be helpful in measuring progress in movement performance. The project also works offline, which can provide more fluid visual feedback (~30 fps)

- **Tech skills used: Human Pose Estimation, OpenCV, SQLite, Python, Docker, Git, GitHub, Data Analylsis**

JOINT ANGLE MEASUREMENT - Image Classification & Analysis
Used transfer learning on VGG16 to classify poses and a Carnegie Mellon model for pose estimation. Poses to be classified were: squatting, bending over, and raising arms. Used 390 images for training, validating, and testing the VGG16-based transfer learning model. Utilizing CMU's OpenPose, calculated joint angles for squat pose. Classifier model performed at~97% accuracy for validation and testing sets

- **Tech skills used: Data Acquisition, Data Analysis, Python, Docker, Machine Learning - Transfer Learning, Matplotlib**

WORK EXPERIENCE

DATA SCIENCE RESIDENT
Galvanize Inc
New York, NY | September 2020 - Present

- Built, revised, and delivered curriculum content, training tutorials, and lectures on scientific Python, SQL, probability, statistics (Bayesian/frequentist), ML, CNN, time series, and data engineering to PhD/Masters' graduates/professionals.
- Owning weekly business KPIs for student/customer relationships through in classroom support, targeted cultivation campaigns through 1 on 1 meetings, virtual informational sessions, on-campus events, and student focused panels.

MACHINE LEARNING ENGINEER - COMPUTER VISION
RefiBot
Remote | August 2020 - December 2020

- Using Tensorflow, design and implement ML algorithms for AI security system (RefiCam). Work with team engineers to integrate human pose estimation, action recognition, and object detection models for crime analysis
- Apply bayesian principles for noise reduction/ filtering techniques to improve human pose estimation accuracy
- Research computer vision algorithms for object detection and action recognition (OpenCV, YOLO)

DATA SCIENTIST/MACHINE LEARNING ENGINEER
ExoDerma
Remote | June 2020 - December 2020

- Investigate mathematical models for human motion, study movement efficiency and provide in-depth analysis of human movement. Develop own dynamic model of human movement to produce ML algorithms with state of the art performance in 2D human pose estimation. Apply kinematic equations for calculation of movement metrics
- Research parallel and distributed computing and multi-threading techniques to increase performance for multi-camera 3D pose estimation. Incorporate 3D pose estimation into cost effective motion capture system

RESEARCH ASSISTANT
Rutgers University - Biomedical Engineering Department
New Brunswick, NJ | September 2016 - May 2018

- Machine Learning & GUI development for scoliosis detection using ultrasound scans. Collect over 1000 ultrasound scans from volunteers to perform manual image segmentation to train bone surface localization ML model
- Prototype testing: Measure effect of power on Fluorescent Lifetime Imaging Microscope (FLIM) accuracy
- Data acquisition, hardware set up, and software integration with MATLAB for gum oxygenation prototype

RESEARCH ASSISTANT
University of Rochester - Biomedical Engineering Department
Rochester, NY | May 2017 - August 2017

- Salivary gland cancer research, data acquisition, and analysis guided by Dr. Benoit. Analyzed effects of neurotrophic factors on cellular regeneration after cell damage. Utilized real time qPCR analysis to measure DNA concentration and cell viability in rat salivary gland cancer models and presented research to a Council of Undergraduates (200+ attendance)

ACADEMIC BACKGROUND

Data Science Immersive Program
Galvanize Inc | New York, New York | June 2020

- Out of 75 applicants nationwide (1.3% acceptance award rate), received the Galvanize Immersive Full Scholarship
- Python-based curriculum including relevant and advanced practices in machine learning, statistical analysis, natural langauge processing, and data visualization

BS Mechanical/Biomedical Engineering
Rutgers University | New Brunswick, New Jersey | May 2012, 2018

- 1st place Senior Design Conference for work on Scoliosis detection using ultrasound and machine learning
- 2nd place at Computer Assisted Orthopedic Surgery 2018 conference - coauther of publication