Andrew **Presland**

Software Engineering · Machine Learning · Data Processing

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Objective

I seek a role in machine perception, computer vision and autonomous systems. I bring professional experience as a machine learning and software engineer which is combined with a background in scientific computing and data analytics for particle physics (CERN Reseach Fellow). Focus has been achieved by recent certifications and portfolio projects in deep learning, robotics and computer vision.

Experience

Data Scientist (Location Technology)

Luzern, Switzerland

AxonVIBE AG. *2018 - 2021*

- Data Scientist in a team responsible for detection and classification of behavioural patterns in users mobility starting from mobile sensor data (GNSS/IMU).
- Pre-processing, Anomaly Detection and Monitoring of remote sensor data using Apache Beam, TensorFlow TFX Transform , TFX Data Validation.
- Explorative Data Analysis using in Python with Scikit-learn, matplotlib and Jupyter Notebook.
- Development of Machine Learning models (Random Forest, Gradient Boosting Machine) involving feature engineering, feature selection, hyperparameter search, cross validation and model evaluation with confusion matrices, RoC curves for trajectory classification.
- Development of Deep Neural Networks for deployment on edge (mobile) devices for Human Activity Detection based on data from IMU sensors.
- Development of graphical models aggregating user data based as descrete-time 2nd order Markov Chains to predict users future destinations and mode-of-transport.
- Developed a Significant Location Detection process in Python using spatio-temporal clustering to segment GPS trajectories into stop/move episodes, density based clustering of stop episodes into significant locations with rules based semantic labeling.
- Productionized Significant Location Detection in Java as a Spring Boot Batch service including ETL and JDBC data connections.
- Exposed significant locations as a Spring Boot RESTful service and visualization with Javascript frontend dashboard.

Senior Software Engineer (Embedded Systems)

Luzern, Switzerland

bbv Software Services AG. *2010 - 2018*

- Consultant Software Engineer with focus on delivering high quality testable embedded software by applying Agile, Extreme Programming and SOLID design principles.
- Development of the Communication (TCP/IP) and Security (SSL/TLS) modules of a SmartEnergy IoT Gateway based on a STM32 Arm Cortex embedded system running Segger the embOS RTOS.
- Development of the Hardware Abstraction Layer for a SmartEnergy platform based on a STM32 Arm Cortex embedded systems and running the ThreadX RTOS.
- Development of calibration and real-time motion control software for industrial robots used in semiconductor fabrication. The master-slave real-time distributed control system communicated over fieldbus on a PowerPC embedded system running Indel INOS RTOS.
- Quality Assurance Engineering for a medical system consisting of a mobile application providing diabetes management of an autonomous insulin pump controled over bluetooth. Test automation consisting of device abstractionin XML and Java, executable behaviour specification with Cucumber, artifact managment with JFrog and test with Appium and CI with Jenkins.

Project Leader (Software Engineering)

Luzern, Switzerland

Hagenbuch Hydraulic Systems AG. *2006 - 2010*

- Development of real-time motion control systems (PID) for 6DOF parallel kinematic manipulators (Stewart Platforms) and high performance shakers (Vibration Analysis) using distributed systems connected by fieldbus.
- Real-time signal processing for motion control optimization (harmonic suppression) and visualization (spectral analysis).
- HMI application development using the Microsoft .Net framework.
- Level-2 technical support.

Research Fellow (Applied Physics)

Geneva, Switzerland

European Organization for Nuclear Research (CERN) *2003 - 2006*

- Computational Physics developer for the Emerging Energy Technology section working on Accelerator Driven Systems (ADS) by applying Monte-Carlo particle transport simulation to Combinatorial Geometry models of the LHC.
- Monte-Carlo simulation of multi-particle transport for studies of thermal energy deposition via intra-nuclear cascade within the LHC beam-line magnets under accident scenarios at the LHC.
- Studies of the single-event upset rate in the LHC control electronics under beam accident scenarios which can result in degredation of LHC controls
- Application of the CERN high performance computing cluster to Monte-Carlo particle transport simulation.

Post Doctoral Research Associate (High Energy Physics)

Geneva, Switzerland

H. H. Wills Physics Laboratory, University of Bristol

2001 - 2003

- Member of the LHCb collaboration, a detector at the LHC searching for the source of matter-antimatter asymmetry in the universe by studying particles containing b-quarks.
- Contributed to the Object Data Model for the LHCb Event Data and development of the LHCb Event Data Processing Framework (Gaudi)
- Scientific Data Analysis of simulated (Monte-Carlo) event data using ROOT Data Analysis Framework.

Doctoral Researcher (High Energy Physics)

Bristol, UK

H. H. Wills Physics Laboratory, University of Bristol

1998 - 2001

- Member of the CMS collaboration, a general purpose detector at the LHC primarily focussed on the search for the Higgs Boson.
- Prototyping of the PbWO4 scintillating crystal calorimeters and photon detector readout for detecting electromagnetic particels.
- Reconstruction of particle energy using clustering algorithms to process signals from photon sensor readout.

Skills

Code	Python, C++, Cuda, JAVA, Scala, MATLAB, SQL
Numerical	Pobability, Statistics, Linear Algebra, Calculus, Scientific Data Analysis
ML/AI/Vision	Random Forests, Gradient Boosting Machines, PCA, Clustering, Hyperparameter search, Cross-Validation, CNN, RNN, LSTM, Objected Detection, Vector Embeddings, Activation Maps, Saliency, Feature Detection, Feature Tracking, Optical Flow
Frameworks	Tensorflow, Keras, TensorRT, OpenCV, Scikit-learn, numpy, pandas, scipy, Jupyter, Apache Beam, Apache Spark, Tensorflow Extended (TFX), AWS Lambda Batch S3, Docker
Robotics	ROS, Gazebo Simulator, RViz, URDF
Embedded	Embedded Linux, RTOS, Microcontrollers, DSP, Fieldbus, Distributed Controls
Languages	English, German

Education

Ph.D. Experimental High Energy Physics

Bristol, U.K.

H. H. Wills Physics Laboratory, University of Bristol

1998 - 2001

B.Sc. Applied Physics (1st Class)

Stoke-on-Trent, U.K.

Staffordshire University

1995 - 1998

B.A. Graphic Design (2nd Class)

Leeds, U.K.

Leeds Beckett University

1989 - 1991

Certifications

06.2021	**AMRx: Autonomous Mobile Robots**, Locomotion, Perception, Localization, SLAM, Intelligent Navigation.	*ETH Zurich / edX*
03.2021	**Robotics Software Engineering**, Autonomous robotic development with ROS and Gazebo Simulator.	*Udacity*
02.2021	**Tensorflow: Advanced Techniques**, Segmentation, Autoencoding, GANS, Distribution, Optimization.	*DeepLearning.AI*
01.2021	**Tensorflow: Developer Certificate**, Image Recognition, Object Detection, Data Augmentation, NLP.	*Tensorflow.org*
12.2017	**Functional Programming in Scala**, Functional Programming, Big Data, Apache Spark, Parallel Computation.	*EPFL / Coursera*
08.2017	**Oracle Certified Associate: Java SE8 Programmer**,	*Oracle*