SERGIO DANIEL HERNANDEZ CHARPAK

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French ◦ Colombian

Education

École Polytechnique Fédérale de Lausanne — Lausanne, **Switzerland**
Computational Science and Engineering, Master Thesis Student — *September 2017 - February 2020*

Universidad de los Andes — Bogotá**, Colombia**
Physics, Bachelor of Science — *January 2010 - March 2017* - GPA **4.23**/5.00
Computing Engineering, Bachelor of Engineering — *January 2010 - March 2017* - GPA **4.23**/5.00
Japanese Language and Culture, Minor

Kyoto Institute of Culture and Language — Kyoto**, Japan**
Intermediate Japanese Student — *October 2013-March 2014*

Lycée Français Louis Pasteur — Bogotá, **Colombia**
Student — *Graduated, July 2009*
Scientific Bachalauréat, Mention Bien

Work Experience

École Polytechnique Fédérale de Lausanne (EPFL)
G-Lab
Geneva, Switzerland
September 2019 - February 2020

Scientific Assistant – Neurorestore – Computational Neuroscience Unit
Contributing with image processing, data analysis in several research projects around personalized targeted spinal cord stimulation paradigms for spinal cord injury patients.

Nagra Kudelski Group
Cloud
Cheseaux, Switzerland
February – July 2019

Internship – Cloud Infra Team
Enabled the usage of real-time deep learning in production for anomaly detection in data streams. Developed neural networks models for unsupervised anomaly detection on time series. Transferred the models in a different environment using Scala, Spark and Deeplearning4J. Pipelined data and deployed the models for alert generation in real time, under the supervision of engineer *Arnaud Gaillard*.

Research Experience

École Polytechnique Fédérale de Lausanne (EPFL)
G-Lab & MIP Lab
Geneva, Switzerland
September 2019 - February 2020

Master Thesis - Prof. Courtine's Laboratory & MIP Laboratory (prof. Van De Ville)
Conducting lumbar spinal cord fMRI study to deconstruct the segmental innervation of sensorimotor circuits in the lumbosacral spinal cord in healthy subjects during passive, active movements and tendon vibrations. Integrating this information personalized targeted spinal cord stimulation paradigms for spinal cord injury patients under the direction of PhD students Andreas Rowald, Nawal Kinany, prof. *Gregoire Courtine* and prof. *Dimitri Van De Ville*.

École Polytechnique Fédérale de Lausanne (EPFL)
G-Lab
Geneva, Switzerland
August 2018 – February 2019

Master Semester Project - Prof. Courtine's Laboratory
Artificially represented the brain input to the spinal sensorimotor circuits through the implementation of unsupervised and supervised learning strategies to drive a biomechanical model of the lower limbs of a human. Integrated a deep learning framework into biological realistic representations of the spinal cord combined with biomechanical modeling under the direction of PhD student *Andreas Rowald*.

École Polytechnique Fédérale de Lausanne (EPFL)
MIP Lab
Geneva, Switzerland
February - July 2018

Master Semester Project - Medical Image Processing Laboratory
Processed high resolution 7-Tesla 1-TR fMRI data FMRI data using the Total Activation method, and found the innovation-driven Co-Activation Patterns (iCAPs) and their time behaviors on three different paradigms. Worked under the direction of PhD student Anjali Tarun and the supervision of prof. *Dimitri Van De Ville*.

Universidad de los Andes
Department of Computing Engineering
Bogotá, Colombia
August - December 2016

Undergraduate Thesis
Implemented part of an Image Analysis tool for the Segmentation of the aorta artery for applications such as the quantification of the elasticity of the aorta artery and quantification of the aorta artery calcifications under the direction of prof. *Marcela Hernandez* and prof. *Leonardo Florez*.

Laboratoire CPPM
LSST Project
Marseille, France
June 2016

Internship - LSST Project
Studied and implemented different image processing and statistic techniques for the detection of transients in astrophysical images. Under the supervision of scientist *Dominique Fouchez*.

Universidad de los Andes
Department of Physics
Bogotá, Colombia
January - May 2016

Undergraduate Thesis
Titled Laniakea in a Cosmological Context. Detected galaxies superclusters in simulated cosmological structures based on galaxies velocities properties under the direction of prof. *Jaime E. Forero*.

Universidad de los Andes
School of Engineering
Bogotá, Colombia
August 2015 - December 2016

Undergraduate Research Assistant
Developed Python tools for testing prototypes in the project Astronomical Image processing from large all-sky photometric surveys for the detection and measurements of transients under the mentorship of prof. *Marcela Hernandez*.

Fermi National Laboratory
Neutrino Division
Batavia, U.S.A.
June –July – August 2015

IPM Intern – Muon G-2 Experiment
Part of the team for the Test Beam of a Straw Detector Prototype in charge of the High Voltage and assisted with the analysis of the data taken under the mentorship of scientist *Brendan C Casey*.

Tokyo University of Marine Science and Technology
Tokyo, Japan
May -June 2014

Visiting Student - Control and Robotics Laboratory
Assisted with the integration and control of a helicopter with Arduino under the supervision of professors *Sho* and *Ito*.

Teaching Experience

Universidad de los Andes
Bogotá, Colombia
2011,2012,2013,2014,2015

Undergraduate Teaching Assistant
Teaching Assistant for Object Oriented Programming, Data Structures, Modeling, Simulation and Optimization, and Computational Methods courses.

Publications and Conferences

XV LARIM (Latin American Regional IAU Meeting)
Cartagena, Colombia
October 2016

Oral Talk - Laniakea in a Cosmological Context
Detected galaxies superclusters in simulated cosmological structures based on galaxies velocities properties under the direction of prof. Jaime E. Forero.

Skills

Software and programming

Github: https://github.com/sercharpak

Proficient
Python, MATLAB, C, C++, Java, Git, LaTeX, Bash, Pytorch, Deeplearning4J, Spark, Scala
OS: Linux, Windows and Mac OS.

Experienced
FLUENT, Javascript, HTML5, CSS, Firebase, Processing, Arduino, Assembler, UML, PHP, MPI, Neuron, Webots, Quantum Espresso

Online certified courses

Udemy **(2017) -** Machine Learning A-Z: Hands-On Python and R in Data Science

Udemy **(2017) -** Deep Learning A-Z: Hands-On Artificial Neural Networks

Languages

French (fluent) Spanish (fluent) English (fluent) Japanese (Intermediate, JLPT level 3-2)