**SERGIO DANIEL HERNANDEZ CHARPAK**

3 Chemin de Boston, 1004 Lausanne Switzerland ○ (+57) 1 2325803 ○(+41) 78 7324340

[sergiocharpak@gmail.com](mailto:sergiocharpak@gmail.com) ○ [sergio.hernandez@epfl.ch](mailto:sergio.hernandez@epfl.ch)

<https://sercharpak.github.io/> ○ [www.linkedin.com/in/sd-hernand-charpak](http://www.linkedin.com/in/sd-hernand-charpak)   
French ○ Colombian

# Work Experience

|  |  |
| --- | --- |
| ***Nagra Kudelski Group***  *Cloud*  Cheseaux, Switzerland  *February 2019 - Present* | **Internship – Cloud Infra Team**  Implemented real time alert generation pipelines using unsupervised deep learning models (auto-encoders) trained for anomaly detection on log data streams. Developed from several models in Keras and Pytorch. Implemented an anomaly detection framework in Scala, Spark and Deeplearning4J, deployed the trained models in a distributed system and sent alerts to an Elasticsearch dashboard, under the supervision of Engineer Arnaud Gaillard. |

# Education

|  |  |
| --- | --- |
| **École Polytechnique Fédérale de Lausanne** | Lausanne**, Switzerland** |
| **Computational Science and Engineering,** Master Student | *September 2017-Present* |

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

|  |  |  |
| --- | --- | --- |
| **Tokyo University of Marine Science and Technology** | | Tokyo**, Japan** |
| **Visiting Student**  Control and Robotics Laboratory | *May 2014-June 2014* | |

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

|  |  |
| --- | --- |
| [**Lycée Français**](http://www.lyceechicago.org/)**Louis Pasteur** | Bogotá, **Colombia** |
| **Student** | *Graduated, July 2009*  *Scientific Bachalauréat, Mention Bien* |

# Research Experience

|  |  |
| --- | --- |
| ***École Polytechnique Fédérale de Lausanne (EPFL)***  *G-Lab*  Geneva, Switzerland  *August 2018 - Present* | **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**  Perfect Score of 5.0/5.0. 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. |

**Additional Work Experience**

|  |  |
| --- | --- |
| ***Mariño Math***  Bogotá, Colombia  Sept 2011-Present | **Tutor**  High School Physics, Chemistry, Math and Biology Tutoring in both French and Spanish. |

**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) |