Nicolas Hug

PhD Student in Machine Learning, programmer

Experience

2014-Now **Phd Student in Machine Learning**, *at the Research Institute in Computer Science of toulouse*, supervised by Henri Prade, Gilles Richard, and Mathieu Serrurier.

The goal of my PhD is to study the empricical behaviour of analogical classifiers (somewhat related to k-NN classifiers), and to exhibit some of their theoretical properties. My main publication so far was at ECAI 2016:
- Analogical Classifiers: A Theoretical Perspective

2014 **Machine Learning Research Internship (6 months)**, *Intelligent Systems Lab*, University of Bristol, UK.

Development of a classifier for musical intrument sounds. The training set consists of single-note audio files, and the classifier must predict the instrument.
- Cleaning and organization of the training data in a suitable database.
- Signal processing: computation of CQT/FFT transforms.
- Heavy usage of linear regression models with categorical variables, with multiple tweaks to comply with the musical nature of signals.

2013 **C developer internship (6 months)**, *Laboratory for Analysis and Architectures of Systems*.

Development of a prototype for an embedded automotive application on a Freescale PowerPC chip. The goal was to transfer binary files from a PC to an embedded chip so that the chip can dynamically run the binaries.
- Design of a SPI link between a PC and the embedded chip.
- Design of a file transfer protocol.
- Dynamic integration and execution of the binary files by the embedded application.

Open source projects

Recom-mender Systems During my free time I developed Surprise, a Python package to build, evaluate and compare recommend systems. It is fairly popular and is by far the project I am the most proud of. I believe this project is a perfect illustration of my skills both as a programmer and as a data scientist.

OS development In 2012, with three other students: design and development in C++ of a graphical user interface for a student Operative System. We developed everything, from the graphics drivers (VSA and VESA) to the end user applications, such as a terminal emulator, a file explorer, an image viewer and a drawing software.

Programming skills

I am highly proficient in Python and C (see projects). I am very familiar with Python's scientific tools (Scikit-learn, Numpy, Pandas, Matplotlib) and with Cython (for optimization). I use Linux daily, and pay careful attention to code quality.
Other languages I am acquainted with are OCaml, Java, C++, Ada, Prolog and Php.

Teaching commitments

During my PhD, I gave (mostly practical) lessons in various CS topics (64 hours per year):

Under graduate	Concurrency and threads in C. Ocaml, Python and Ada basics. Also gave a few lectures on general AI.
Post graduate	Graph theory, linear programming and reinforcement learning.

Education

2013-2014	**Master's Degree in Artificial Intelligence**, *Université Paul Sabatier*. Valedictorian (over ten students).
2008-2013	**Master's Degree in Computer Science engineering, specialized in critical embedded systems**, *Institut National des Sciences Appliquées of Toulouse (INSA)*. Last semester at the Faculty of Engineering of the University of Buenos Aires.

More about me

When I'm not working on my PhD or on Surprise, you may find me rock climbing or hiking, lost somewhere in the Pyrenees (French mountains)… But really, my taste for exercise is only a workaround for my true passion: food!