Introduction

Machine learning is revolutionizing the way people use data. Python is changing how we make code due to its user-friendly interface and powerful syntax. Then, why not to allow programmers to use machine learning when programming in Python? My project aims to provide Python bindings for all *mlpack* functions with standardized APIs.

Project goals

During the period of the Google Summer of Code, I am committing to:

- Provide Python bindings for *mlpack* functions with unit tests when necessary
- Write useful documentation to help new users through the new Python interface
- Configure CMake to install the bidings

Timeline

After gaining some experience writing bindings during the first month, it is expected that coding bindings becomes a faster process, allowing to produce 2 bindings per week. The last few weeks of the Google Summer of Code period is kept as an error margin for unexpected problems that might happen.

Jun/17 – Jun/23	CMake configuration, Density Estimation Trees
Jun/24 – Jun/30	Euclidian Minimum Spanning Trees
Jul/1 – Jul/7	Gaussian Mixture Models
Jul/8 - Jul/14	Hidden Markov Models
Jul/15 - Jul/21	Kernel PCA
Jul/22 - Jul/28	K-Means Clustering, Least-Angle Regression
Jul/29 – Aug/4	Local Coordinate Coding, Locality-Sensitive Hashing
Aug/5 – Aug/11	Naive Bayes Classifier, Neighborhood Component Analysis
Aug/12 – Aug/18	Principal Component Analysis, RADICAL
Aug/19 – Aug/25	Simple Least-Squares Linear Regression, Sparse Coding
Aug/26 – Sep/1	Tree-Based Neighbor Search, Tree-Based Range Search
Sep/ 2 – Sep/8	Flexible week
Sep/9 – Sep/15	Flexible week
Sep/16 – Sep/22	Final reviews

About me

My name is Matheus Vieira Portela and I am a 4th year Mechatronics Engineering student from University of Brasília, Brazil. Currently, I am doing an exchange at the Australian National University sponsored by the

government of my country.

Python was my first programming language, back in 2009. Since then, I have been using Python (with Numpy, Matplotlib and PyQt libraries), C/C++ (with Armadillo and Qt), MATLAB and Makefile in several different applications, such as simultaneous localization and mapping for mobile robots, robot soccer and human-computer interaction.

During this semester, I am taking the machine learning and computer vision courses at the university, reason why I got really excited when I saw *mlpack* in the list of mentor organizations. This will be the perfect opportunity of join some of this knowledge with the huge passion that I have for Python.

Moreover, open-source software is a philosophy for which I have enormous appreciation. In my opinion, technologies would be able to evolve much faster if all code was open-sourced and shared between communities. A few years ago, I decided to bring this philosophy to my day-to-day life by using Linux, Android and open-source software instead of closed-sources variants. Being part of this movement is a dream that, now, can be realized.

Since my first year at the university, I have worked in projects of all sorts: voluntary in the robot soccer team, as an undergraduate researcher in probabilistic robotics and doing summer internship research in HCI. With these previous experiences, I learned how to work with other developers, being mentored by a professor and setting my own timetables, skills that will definitely help me during the Google Summer of Code.

Throughout the program, I will surely be able to work between 20 and 30 hours per week. Even though I am in the Southern Hemisphere, most of the Google Summer of Code will occur before the start of the second semester, which will be only in August 19th. In this sense, I plan to compensate the hours spent in the university by working during the evenings and weekends.

Working physically apart from a supervisor is a problem that can be solved by proper communication schemes. I intent to use version control software, such as SVN or Git, to keep my supervisor up-to-date of the coding. Also, I will write e-mails daily about my accomplishments or problems. Finally, if possible, weekly videoconference meetings should be scheduled.

Despite Portuguese being my native language, my exchange and last internship gave me enough experience on working in English.

Besides programming, I am a Boy Scout since 2004, with multiple awards, and also practice Aikido and play the guitar as hobbies.

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I appreciate the attention given.
Yours sincerely,
Matheus Vieira Portela