Parkinson’s disease data analysis

**Duration**: 6 months  
**Team**: Loki (Inria Lille – Nord Europe & CRIStAL)  
**Advisor(s)**: Géry Casiez (gery.casiez@univ-lille.fr)

Parkinson disease (PD) represents more than 150 000 cases in France and is thus considered as the 2nd cause of adult motor disability. It is essentially characterized with extremities tremors, slow movement, muscular stiffness as well as fine motor skills impairment. Medics usually use standard tests in order to evaluate PD evolution but these tests do not allow to analyze in isolation these numerous symptoms.

In the ParkEvolution project\(^1\), we study PD patients fine motor skill in an ecological environment, and in a longitudinal way; through the analysis of cursor position and raw computer mouse information associated to common task such as pointing when PD patients use their own computer.

**Description**

Behavioral data in relation with the kinematics of end-effector movement during accuracy control task has been collected. Analysis of this data require analytical methods borrowed from the domains of **data analysis**, **clustering** and **machine learning**. Some analysis with large correlation matrix would also be considered. The aim of the current project will be to understand and to classify the origin of motor disorder observed on PD.

The candidate will be essentially involved in data analysis, data organization and synthesis as well as data visualization of the whole data collected from PD patients included in the research protocol of ParkEvolution project. The candidate should demonstrate a high level in programming and data analysis.

**Candidate**

Ideally the candidate should hold a Master in Computer Science and be trained to clustering method and machine learning.

**Context**

LOKI is a dynamic world class HCI research group whose research aims at producing original ideas, fundamental knowledge and practical tools to inspire, inform and support the design of human-computer interactions. Members of LOKI frequently publish in top-tier HCI conferences such as ACM CHI and ACM UIST. The selected applicant will work with Prof. Géry Casiez, in collaboration with Laure Fernandez from Institut des Sciences du Mouvement, CNRS / Aix-Marseille Université.

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\(^1\) [https://parkevolution.org/](https://parkevolution.org/)