



Universidad  
Tecnológica de  
Panamá  
Vicerrectoría de  
Investigación,  
Postgrado y  
Extensión

# ICHF5080820

## M4S: Mobile-computing-based Multitasking for Mild cognitive impairment Monitoring and early Screening

### Vigencia del Proyecto

2019 - 2021

### Estado Actual

En Ejecución

### Objetivo General

This project aims to study the impact of the cognitive condition on the interaction and use of smartphones in order to support the early diagnosis of mild cognitive impairment. User Behavior and Interaction Patterns (called BIPs) will be studied as part of dual tasks in which the user is, in this case, walking (including gait analysis) and using the smartphone at the same time.

### Resumen

Mild Cognitive Impairment (MCI) is defined as a “cognitive decline greater than expected for an individual’s age and education level, but that does not interfere notably with activities of daily life”. First signs of MCI are difficulties in the performance of everyday activities, particularly haptic activities, such as interaction with a mobile device. The functional evaluation is typically performed during dual tasking. The three pillars of this project are:

- Cognition (based on Electroencephalography analysis EEG)
- Gait (using sensorized insoles to perform quantitative gait analysis, QGA)
- Haptic interaction with mobile devices

The hypothesis is that **long-term monitoring of interaction patterns with mobile devices on the move (walking, running, etc.) can be correlated with the onset of cognitive decline and support the early diagnosis of MCI.**

This project has been divided into 6 phases, which includes the different stages of technological infrastructure involved, which will be reduced throughout the duration of the project.

The methodology follows an iterative and incremental process to progressively think, build and evaluate the system to reach the marked objectives. Each phase will generate a series of artefacts that serve as input for following stages, and enable us to meet partial goals (defined as operative objectives), to finally meet the general objective.

### Área de Investigación

Tecnologías de la Información y Comunicaciones

### Sector al que pertenece

Cognition and Technologies

### Programa al que se adscribe

Investigación y Desarrollo (I+D)

### Sede Ejecutora

Chiriquí

### Unidad o Facultad Ejecutora

FAC. DE ING. SISTEMAS

### Sitio Web

<https://mamilab.eu/m4s-project/>

## Investigadores

**Vladimir Villarreal Contreras** - *Co-Investigador (Co-IP)*

**Ramón Hervás** - *Investigador Principal (IP) - (Inv. Externo)*

José Bravo - *Co-Investigador (Co-IP) - (Inv. Externo)*  
Jesús Fontecha - *Co-Investigador (Co-IP) - (Inv. Externo)*  
Chris Nugent - *Co-Investigador (Co-IP) - (Inv. Externo)*  
Sergio Ochoa - *Co-Investigador (Co-IP) - (Inv. Externo)*