

PROJECT / Smart Bikeemotion

SBikee

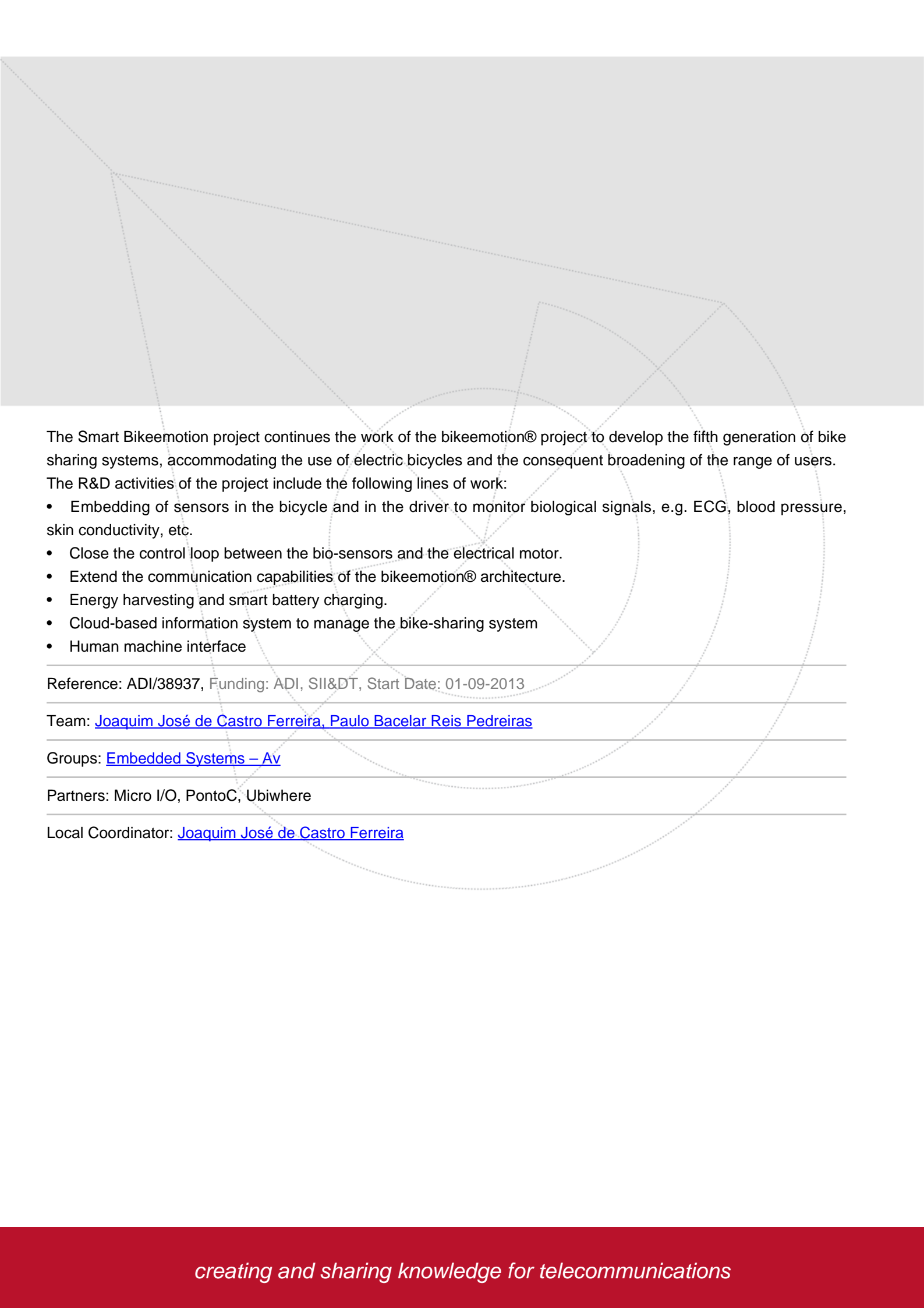
Main Objective:

Bike sharing systems have been very successful in many cities worldwide. In Aveiro, Portugal, the BUGA system was pioneer, but it has never evolved to an automated operation mode. The first automated bike sharing system in Portugal, was deployed in Vilamoura in 2011/12. There are some relevant examples of popular and effective bike sharing system in Europe, notably in London, Paris, Barcelona, Madrid and Hamburg.

Current automated bike sharing systems require docking stations to park the bicycles, to interface with the user and to connect them to the backhauling information system. The evolution of these systems was mostly concentrated on the information systems, improving the usability, the access (mobile phone and web) and the payment process.

We are witnessing a growing dissemination of electric bicycles. These bicycles behave like conventional bicycles, as they can be used without electrical motor support, or as semi-assisted electrical bikes ("pedelecs"), since the driver has to move the pedals. With electrical motor support, the autonomy is around 100km without significant driver physical effort, except the need to move the pedals. It is expected that this technology will multiply by 5 (from 6% today to 30%) the number of potential users of bike shared systems, encompassing people moving for work, people aged over 60 and people with poor physical shape unable to ride a standard bicycle for medium size journeys.

The recently concluded bikeemotion® project, integrating Ponto.C, Ubiwhere, Micro I/O and the University of Aveiro, has developed a prototype fourth generation (station less) bike sharing system adaptable to any bicycle, in which the bicycle includes not only the locking system, but also GPS and mobile communications. In July 2013 the bikeemotion® prototype was awarded the "Urban Planning and Urban Design – Cycling Visionaries Award – Voting Prize", during the Velo-City 2013 held in Vienna Austria.



The Smart Bikeemotion project continues the work of the bikeemotion® project to develop the fifth generation of bike sharing systems, accommodating the use of electric bicycles and the consequent broadening of the range of users. The R&D activities of the project include the following lines of work:

- Embedding of sensors in the bicycle and in the driver to monitor biological signals, e.g. ECG, blood pressure, skin conductivity, etc.
- Close the control loop between the bio-sensors and the electrical motor.
- Extend the communication capabilities of the bikeemotion® architecture.
- Energy harvesting and smart battery charging.
- Cloud-based information system to manage the bike-sharing system
- Human machine interface

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