Description of Funded Research Projects
1st Call for H.F.R.I. Research Projects to support Post-Doctoral Researchers

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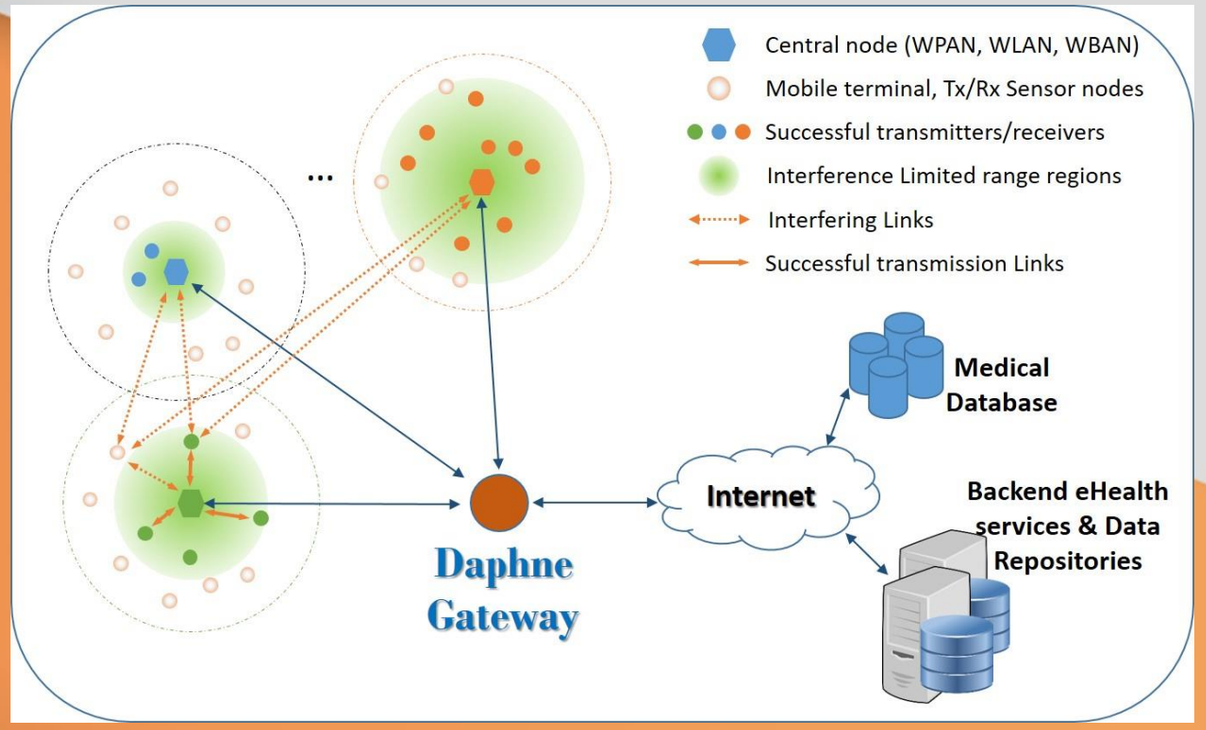
Hellenic Foundation for Research & Innovation

Research Project Title:

DAPHNE - Resilient network services for critical mHealth applications

Principal Investigator:
Emmanouil G. Spanakis



Popular Title:
Resilient networking services to support critical mobile health applications

Scientific Field:
Engineering and Technological Sciences

Host Institution:
Foundation for Research and Technology Hellas, Institute of Computer Science

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Research Project Summary

Future mHealth informatics rely on innovative technologies and systems for transparent and continuous collection of evidence based medical information at anytime, anywhere, despite coverage and availability of communication means. This emerging critical infrastructure is influenced by factors such as biomedical and clinical incentives, advances in mobile telecommunications, information technology developments, and the socioeconomic environment. This cross dependency has led to concerns about reliability and resilience of current network deployments and hence it is imperative that communication networks must be designed to adequately respond to failures especially in a cloud, mobile, IoT/WoT environment that have traditional boundaries. We thus, propose DAPHNE, a resilient networking service for critical related applications, as a novel approach for next generation mHealth information exchange. Our goal is to provide in-transit persistent information storage allowing the uninterruptible provision of crucial services overcoming network instabilities, capacity efficiency problems, incompatibilities, or even absence of end-to-end homogeneous connectivity, emphasizing on future networks and services (i.e. 5G).

We aim to provide a set of tools for the appropriate management of communication networks during their design time and avoid the “build it first, manage later” paradigm. We will analyze vulnerabilities from a fault tolerant perspective, study the lack of diversity and redundancy in network topology, extract resilience requirements and propose a self-healing-based framework for future networks. In addition, we will emphasize on reliable system operation with extremely low power consumption focusing on future mHealth sensor networks communication for monitoring of people. DAPHNE aims to design an energy efficient network infrastructure, robust to malfunctions, inherently fault-tolerant and self-healing with minimum cost and complexity. DAPHNE, is envisaged as a complex micro system, able to act as an ubiquitous gateway, with dedicated building blocks and functionalities for reliable networking communications in the evolving infrastructure for future mHealth.

Project Impact on Society

This project is designed around the complexity and challenges of providing reliable services in the evolving communications infrastructure for future mHealth services. The challenge is to facilitate the adoption of new beyond state-of-the-art tools for the engaged and the unengaged population who are the beneficiaries of using modern mHealth/eHealth services, in order to:
i) better utilize technology for providing critical personalized care monitoring services for people in need; ii) expand health-care services (continuity of care irrespective of user location) increasing safety, access to information and monitoring away from a hospital; iii) implement, integrate and validate radically new solutions that pave the way to a new generation of remote mHealth; iv) improve cooperation and secure information exchange among the actors involved in health, social and informal care services, and v) increase potential in products and services by measurable market indicators such as new business, start-ups and commercialization.

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To me, H.F.R.I. funding would mean...

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This project is designed around the complexity and challenges of providing reliable services in the evolving communications infrastructure for future mHealth services. The fundamental activity of this research grant is to provide attractive, long-term funding to pursue ground-breaking, high-gain/ high-risk research. This project, funded by H.F.R.I., allows me to: satisfy my research curiosity; collaborate with other important researchers in the field and exchange ideas and results in order to advance and create new opportunities.

It is the driving force for expanding my understanding and knowledge, defining my academic career, establishing valuable networking connections with other research teams and individuals and gaining academic experience that will help me to expand my curriculum, through my participation in high-end conferences and publishing journals, to develop critical thinking, leadership, time management, and communication skills, as well as to explore new research techniques and methodologies.

The Principal Investigator,

Emmanouil G. Spanakis

Funding

Amount: **122,850 €**

Duration: **36 months**

Foundation: **H.F.R.I.**

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