MSc SCHOLARSHIP
REF. GID-MICROREDE 2013-05

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1 MASTER RESEARCH SCHOLARSHIP IN THE SCOPE OF PROJECT GID-MICROREDE – SISTEMA DE GESTÃO INTELIGENTE E DESCENTRALIZADO DE MICRO-REDES DE DISTRIBUIÇÃO PRIVADAS (ADI|QREN 34086)

Project GID-MicroRede – Sistema de Gestão Inteligente e Descentralizado de Micro-redes de Distribuição Privadas (ADI|QREN 34086) is recruiting 1 young researcher owning a Master's Degree in Computer Science/Informatics or similar, with solid experience in the area of Power Systems. This call concerns research activity in the area of intelligent short term management of distributed energy resources in a multi-player competitive environment, including monitoring and control. This project is co-funded by "Fundo Europeu de Desenvolvimento Regional" (FEDER) through COMPETE – "Programa Operacional Factores de Competitividade" (POFC), with the following conditions:

Research field: Computer Science/Informatics.

1. Duration of the Grant: from January 15th 2014 until July 14th 2014 (06 months duration, eventually to be renewed until the end of the project and according to the respective budget).

2. Workplan: Energy policies aiming to lower the environmental impact of the power sector have resulted in a significant increase of Distributed Generation (DG), namely the one based on Renewable Energy Sources (RES). The investments in DG technologies based on RES are huge, namely in the European Union and in Portugal. However, there has been no sufficient effort in developing efficient management methods for the new energy resources. Due to the characteristics of these resources, the traditional management methods are inadequate. This fact, together with an incipient use of smart grid concepts and opportunities is leading to successively higher wind curtailment and to a very low payback of the investments, largely paid with public funds.
GID-MicroRede project proposes the implementation of an intelligent and decentralized management system for private distribution microgrids, leading to a significant increase of the resource management efficiency for these microgrids and for the consumers connected to them.
In this way, the main objective of GID-MicroRede project is the development of methodologies adequate to private distribution micro-grids management considering RES-based generation. The need of a decentralized management of the network and resources is addressed. The project aims to develop software and hardware necessary to implement and use the proposed methodologies in real networks. A simulation platform is another result of the project. This makes possible to consider the validation and application of the proposed methodologies to networks with specific characteristics distinct from the characteristics of the real network developed in the project. In this way, the proposed management methodologies will be adapted to the characteristics of any type private micro-grid.
The result will be an innovative product, above the state of the art, able to position the project promoting companies in a very competitive level in national and international markets.
The project success is ensured by the consortium know how in the field. GID-MicroRede project is related to the scope of an international project involving 42 partners and 10 countries, in which the Portuguese consortium is very relevant, with ISEP being responsible for the work package concerning microgrid management. That project (SEAS - 12004) has obtained program ITEA2 - Call 7 Label (http://www.itea2.org/project/index/view/?project=10156). In order to achieve its goals, GID-MicroRede uses innovating approaches and techniques, including knowledge extraction, optimization, metaheuristics and multi-agent systems modelling and simulation.
The results will be tested using a prototype that enables realistic simulation and in a pilot installation using a real distribution network.

The candidate to be selected will participate in the following project activities:
A3 – Development
A4 – Prototypes and pilots
A5 – Tests
A6 – Promotion and Results Dissemination

The Project Development includes:
- physical interfaces
- middleware
- database implementation and management, knowledge extraction from database data
- distributed energy resources scheduling
- microgrid management methodology
- agent based platform implementation for test and validation

The selected candidate's work includes:
- Upgrade of previously developed models, methodologies and applications;
- Design, implementation, test, and use of the models and methodologies proposed in the scope of the project;
- Preparation, implementation, and test of case studies, prototypes and pilots and respective result analysis;
- Technical reports and scientific papers preparation and writing.

This work includes the design of the foreseen methodologies, their implementation, and test.
The selected candidate will work with GECAD project team and in close cooperation with the other project partners' team.

3. Supervision: The candidate to be selected will be scientifically supervised by Professor Zita Vale.

4. Academic Degree: Master degree in Computer Science / Informatics or similar.

Minimum profile required: Solid background in artificial intelligence, heuristic optimization, modeling, simulation, multi-agent systems, and some experience in the power systems field. At least 2 years of experience in scientific research activities, including the participation in projects dealing with real and/or realistic engineering scenarios, requiring intensive software development and integration effort and the accomplishment of concrete goals within temporal deadlines. Writing and speaking proficiency in English. Author of at least 2 scientific papers written in English. Good skills for team work, including close cooperation with industrial partners.

Preferred profile: Previous work experience in research activities in the area of power systems, multi-agent systems, and heuristic optimization. Good programming skills and experience in the development of artificial intelligence based computer applications. Experience in real and/or laboratorial prototypes in the power system field.

Candidates must have availability to start this Master research scholarship on the date mentioned.

5. Remuneration: As defined by FCT (€ 980.00/month), according to the table of stipends of the country (available in http://alfa.fct.mctes.pt/apoios/bolsas/valores), paid by bank transfer.

6. Workplace: The workplace is at GECAD – Knowledge Engineering and Decision Support Research Center in the following address:
ISEP/IPP
Rua Dr. António Bernardino de Almeida, 431
4200-072 Porto – Portugal

7. Legislation and regulations: Law no. 40/2004, of 18 August ("Estatuto do Bolseiro de Investigação Científica"); Regulation no. 405/2010, of 6 May (published in "Diário da República" no. 88, Serie II, of 6 May 2010) – "Regulamento de Bolsas de Formação Avançada do ISEP"; "Regulamento de Bolsas de Investigação da FCT, I.P., approved by Regulation no. 234/2012, of June 25, amended by Regulation no. 326/2013, of August 27" (www.fct.pt/apoios/bolsas/regulamento.phtml.pt).

8. Candidate selection methodology: Only candidates that have presented the complete set of application documents and showing evidence of having the required minimum profile required will be admitted. The selection method will take into account the following components: final classification of the BSc (15%) and of the MSc degree (35%), curriculum vitae evaluation (50%). In case of doubts, an interview can be undertaken and it will be conducted in English. In this case, the following elements will be taken into consideration: the final classification of the BSc (10%), and of the MSc (20%), the curriculum vitae evaluation (50%), and the interview (20%).

9. Evaluation panel: Prof. Zita Maria Almeida do Vale (panel coordinator), Prof. Maria Goreti Carvalho Marreiros and Prof. Isabel Cecília Correia Silva Praça Gomes Pereira. Members of the substitute panel: Prof. Sérgio Ramos and Prof. Carlos Fernando da Silva Ramos.

10. Results publication and notification: Candidates will be individually notified by email message on the final evaluation results.

11. Application documents: Curriculum vitae; diplomas of the BSc and MSc Degrees; document with courses marks; copy of any previously published works that are relevant for the application evaluation. An application letter with the fellowship reference (ref. GID-MicroRede_2013-05) should be included, indicating clearly the motivation of the application and the full contact information (as minimum: email address, mobile phone number, postal address) of the candidate. All the documents prepared by the candidate for the application should be written in English. Documents should be sent to zav@isep.ipp.pt. Additionally, they should also be sent to the following address:

GECAD (Knowledge Engineering and Decision Support Research Center)
ISEP/IPP
Rua Dr. António Bernardino de Almeida, 431
4200-072 Porto
Portugal

12. Application period: from November 25 until December 06, 2013

13. Additional information can be obtained by phone +351-22-8340511 or by email zav@isep.ipp.pt.