



ERCIM "ALAIN BENSOUSSAN"
FELLOWSHIP PROGRAMME



Scientific Report

First name / Family name	Enislay/Ramentol
Nationality	Cuban
Name of the <i>Host Organisation</i>	Department of Financial Mathematics, Fraunhofer ITWM
First Name / family name of the <i>Scientific Coordinator</i>	Andreas/Wagner
Period of the fellowship	31/10/2019 to 31/10/2020

I – SCIENTIFIC ACTIVITY DURING YOUR FELLOWSHIP

During my period at the Department of Financial Mathematics, Fraunhofer ITWM I worked in the following tasks:

- 1- Electricity prices forecasting: under supervision of Doctor Andreas Wagner and in collaboration with Florian Schirra, we developed a proposal for forecasting the electricity prices using embedding to encode the calendar information in a dense neuronal network. Because of this task, we submitted a paper to the Journal of Commodity Market with Impact Factor 2.670, the Journal Impact Quartile of is Q2. This work was also presented International Ruhr Energy Conference 9th INREC 2020.
- 2- Collaboration in the Bauhaus Mobility Lab (BML) project in the task: traffic forecasting using Federated Learning.

- 3- Preparation of EU project proposal. In collaboration with partners from Sweden, Norway, Slovenia, Montenegro and Germany, we submit a project proposal to the call “H2020-SC6-TRANSFORMATIONS-2020”.
- 4- Preparation of a project proposal for the German call (Drop out in Higher Education) in collaboration with Technische Universität Kaiserslautern and Universität Tübingen.
- 5- Collaboration with ERICSSON AB, Stockholm in the task: learning from imbalanced time series for weather predictions. The related paper should be submitted to the journal KBS by the end of this year.
- 6- Three pending publication from my postdoc in Sweden were finished and published during this year at Fraunhofer.
- 7- A patent proposal was submitted to the patent department of ERICSSON AB.
- 8- Continue with the task as reviewer for the Journals: FUZZY SETS AND SYSTEMS, IEEE Transactions on Fuzzy Systems, Assembly Automation, IEEE Transactions on Cybernetics, International Journal of Information Technology & Decision Making and Knowledge Based System.
- 9- A German evening course was taken at TUK.

II – PUBLICATION(S) DURING YOUR FELLOWSHIP

1. Sahar Tahvili, Leo Hatvani, Enislay Ramentol, Rita Pimentel, Wasif Afzal and Francisco Herrera. A Novel Methodology to Classify Test Cases Using Natural Language Processing and Imbalanced Learning. Engineering Applications of Artificial Intelligence 95(0952-1976):103878. DOI: 10.1016/j.engappai.2020.103878. (2020).
2. Enislay Ramentol, Florian Schira and Andreas Wagner. Short- and long-term forecasting of electricity prices using embedding of calendar information in neural networks. Submitted to the Journal of Commodity Markets. August 2020.
3. Tomas Olsson, Enislay Ramentol, Moksadur Rahman and Mark Oostveen. A Data-driven Approach to Predicting Degradation of a Fleet of Micro Gas Turbines. Submitted to the Journal Energy Conversion and Management: X.

4. Enislay Ramentol, Tomas Olsson, Mats Tallfords and Shaibal Barua. Machine Learning models from industrial applications. Applications of Artificial Intelligence in Process Industry Automation, Heat and Power Generation and Smart Manufacturing. 2020 (Accepted book chapter)

Currently working in the paper “ITISEAM: Imbalance Time Series Algorithm for Multiclass Classification” (in collaboration with Global Artificial Intelligence Accelerator (GAIA), Ericsson AB and School of Innovation, Design and Engineering, Mälardalen University, Västerås in Sweden) to be submitted before December to the Journal Knowledge based System.

III – ATTENDED SEMINARS, WORKHOPS, CONFERENCES

- The Avon Royal Statistical Society local group workshop on "Data Science at Electricity Providers" on Tuesday 29th of September 2020.
- International Ruhr Energy Conference. Digital Conference, September 9-10, 2020
9th INREC 2020 - Uncertainties in Energy Markets.
- Weekly seminar of Deep learning at Fraunhofer ITWM.
- Monthly PhD seminar at Fraunhofer ITWM and TUK.

IV – RESEARCH EXCHANGE PROGRAMME (REP)

During my REP period at the Research Institute of Sweden (RISE-SICS Västerås) I had the opportunity to exchange with some researchers, collaborate in two papers, and write a proposal for an EU call. The main activity I did at RISE was the preparation of the EU proposal. We created a consortium with partners (industry and academia) from Sweden, Norway, Germany, Slovenia, and Montenegro and together we wrote a project proposal submitted to the call H2020-SC6-TRANSFORMATIONS-2020