

“Eugen Ionescu” Postdoctoral Fellowship Report

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Dr. Soraya Sedkaoui

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General Information

Name of Fellow	Dr. Soraya Sedkaoui
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Host institution	Research Center on Informatics and Information Technology Department of Mathematics and Informatics Faculty of Sciences University Lucian Blaga Sibiu, Romania
Supervisor	Pr. Dana Simian
Project Title	<i>"Cognitive Computing and personal data protection under the GDPR"</i>
Period covered	05/03/2019 to 07/31/2019

Signature

Date 07/30/2019

Supervisor

Pr. Dana Simian

Fellow

Dr. Soraya Sedkaoui

Summary

“Eugen Ionescu” Fellowship program is carried out within the institution members of the “Agence Universitaire de Francophonie” (AUF). It leads French-speaking researchers, from higher education institutions of AUF’s members, to benefit from three (03) month research mobility in their field of research interest. This program allows researchers to improve their skills and better conduct their research project in one of the 25 higher education institutions in Romania. This program is part of disciplinary fields deemed to be priorities for the development of Romania and consistent with the research interests of the host institutions.

I had the opportunity to benefit from this program and work on a research project from 05/03/2019 to 07/31/2019. During these three months I worked, at the Research Center on Informatics and Information Technology and the Department of Mathematics and Informatics, faculty of Sciences at the University of Lucian Blaga in Sibiu, on a research project that aims to propose and develop a framework that can allow businesses to comply with GDPR requirements using cognitive computing solutions. Starting from this approach, this project aims to examine the intelligent system as a solution for data processing and data protection and how it to contribute to ensure the compliance.

In order to give an account of the various works carried out during this postdoctoral fellowship, the current report presents the different activities and tasks carried out during these three months.

Introduction

From May 3, to July 31 (2019), I carried out a postdoctoral fellowship at the Research Center on Informatics and Information Technology and the department of Mathematics and Informatics of the University Lucian Blaga in Sibiu, Romania, under the supervision of Professor Dana Simian. Initially, my research project and its objectives focused on the development of the framework based on cognitive computing than can help companies and improve collecting, processing and using personal data in EU to comply with the data protection regulation (RGPD).

In this context, under the supervision of Pr. Dana Simian, as a postdoctoral fellow but also as a researcher aiming to carry out the research work, I got involved in the preparatory work and the steps necessary to conclude this research project.

More broadly, this fellowship was the opportunity for me to deepen my knowledge in big data and analytics field within an excellent and skilled research team, working on parallel projects. That allowed me to enrich my abilities and skills in this field as well to improve my knowledge in other fields.

This variety of integration in many research fields has, however, been beneficial and has the positive repercussions detailed below.

a. Project background

To meet current challenges related to personal data protection, the General Data Protection Regulation (GDPR) came into force in the European Union (EU) since 25th May 2018. This regulation involves significant structural for companies, but also stricter requirements for the collection and management of personal data.

In this context and in order to map all their personal data, companies must develop intelligent solutions that enable them to comply with the GDPR and building a sense of trust. In such conditions, the cognitive computing ought to be able to help companies to extract, protect and anonymize sensitive structured and unstructured data.

This technology, which refers to a data management platform, provides a better mapping for data security and data protection. As a result, this research project tries to explore the dynamism of such technology by devising an approach through which intelligent systems can help companies to ensure the protection of personal to comply with the new requirements.

This project was primarily focused on the systematic review and provided with an overview of existing literature related to the current study. This semantic review and the meta-analysis carried out allow us to gather best practice related to our topic.

Then to show cognitive computing capabilities and the opportunities that it can bring to companies in order to protect personal data under GDPR, we built a framework using a structured scheme, containing a summary of phases and show the capabilities that cognitive computing can bring to ensure compliance.

This framework can be of great help to companies and provide a secure, low-cost process for GDPR compliance. It introduces some new important principles related to the processing of personal data; pseudonymization, transparency, data minimization, etc.

b. Objectives

The primary objective of this post-doc research was to explore practical solutions that would help strengthen GDPR compliance and ensure the protection of personal data. Moving a step forward from documentation and reviewing the most recent studies, especially those related to the GDPR requirements, to building a framework, focusing on GDPR requirements.

The following were identified as key phases of the proposed framework:

- Organization and preparation
- Privacy and Processing
- Compliance evaluation

The above three phases are of fundamental importance to ensure compliance and improve data management practices and proceed in the direction of efficient implementation of regulation’s requirements based on cognitive solutions initiatives.

c. What was done?

The proposed framework introduces a cognitive process to understand and frame the human-machine interactions with respect to the aspects of GDPR in term of data protection and processing.

This solution, that aims to help companies ensuring compliance, must take into account data protection and design by default, the security of processing, the right to be forgotten, the responsibility of the controller, and data protection impact assessment, while the system is under creation. These may help companies to support the assessment of PETs that allow to comply and to satisfy GDPR requirements.

Working in this direction was realized to help fill the identified gap of lost knowledge on cognitive computing techniques for data protection under GDPR. Among the many principles examined are those about the processing of personal data; pseudonymization, transparency, data minimization, etc.

Results

The undertaken research looked into the context of companies that conducting business in EU member states with a focus on exploring viable strategies that could help them to protect personal data for GDPR compliance and at the same time evolving possibilities for economic uplift and sustenance of residents and other stakeholders.

Given the short duration of research and its nature of ongoing continuity with previous and future works, it may not be possible to clearly list down its exact outcomes. However, it can be said for certain that a number of achievements during post-research next months will be a direct consequence of the groundwork accomplished during “Eugen Ionescu” fellowship research.

Possibility to develop guidance catalogs and other publications is still being explored and might materialize sometime in the future if sufficient resources are available to continue with this work.

Diverse

In addition to the activities directly related to my postdoctoral research project, other activities were carried out. Even if they do not have a direct link with the research, they allowed me to look for new useful knowledge for the realization of my research tasks and contributed to the development of my professional network. During my postdoctoral fellowship, the following research activities were also made:

- A research paper was submitted at the sixth International Conference on Modelling and Development of Intelligent Systems (MDIS 2019), that will be held in Sibiu, Romania from 3-5 October 2019. This paper titled “***Developed Framework based on Cognitive Computing to Support Personal Data Protection under the GDPR***”. This paper will be published by **Springer** Verlag in the series Communications in Computer and Information Science (CCIS).
- The work initiated for the paper, proposed to MDIS 2019, will be further pursued in the near future with the objective of submitting it for publication in research journals. The implementation of the proposed framework will be evaluated in many companies both in private and public sector, as well as small and medium enterprises (SMEs), In order to examine its efficiency.
- From May 16th to May 18th (2019), I participated in the organization of the International Conference on Applied Informatics: “Imagination, Creativity, Design, Development”, (ICDD 2019). It is a conference that gives the participants the opportunity to discuss and present their research on informatics and related fields (like computational algebra, numerical calculus, bioinformatics, etc.).
- In addition, I contributed as a paper reviewer for ICDD 2019 organized during my postdoctoral fellowship (16-18 May, 2019).
- I also received an invitation to join the scientific committee of MDIS 2019, and participate in the review process of the conference.
- Further research papers and publications for which primary concepts, were developed during “Eugen Ionescu” fellowship duration, are still underway and planned to be completed in the coming months.
- Participation in the AUF (Réunion des boursiers “Eugen Ionescu”) meeting from 5th May to 7th May, at Bucharest

Perspectives for future collaboration

During my postdoctoral fellowship I realized that there are many strong areas of common interest that we can develop. These including:

- *Academics*: With the objective of organizing training program in the field related to these aspects (In Algeria or Romania). With the possibility of creating a mobility program in ICT.
- *Research*: With the objective of developing better techniques practice based on scientific methods and cognitive solutions

- *Outreach:* With the objective of developing collaborative and academic inclusive strategies for developing and implementing such a solution

A few steps suggested as a starting stepping stone to build future collaborations lies in the collaboration on specific research areas of common interest, such as those fulfilling objectives of research development initiatives, or in the possibility to use this professional mobility for possible events, conferences and workshops.

Skills/Added value transferred to the home institution abroad

Receiving a post-doc fellowship from AUF for being hosted as a research scholar at the University of Lucian Blaga of Sibiu in Romania, was a unique opportunity for reflections and learning within an inspiring setting fit to be the dream of any cognitive computing conversation practitioner.

The “Eugen Ionescu” Post-Doc Fellowship, primarily provided an opportunity to delve deeper into an earlier ongoing “Cognitive solutions for personal data protection” for the European citizens, becoming instrumental in pinpointing some loopholes in existing systems or solutions and identifying future directions of immediate action and possible long term initiatives.

Interaction with professors and researchers at Lucian Blaga University, and especially at the Research Center on Informatics and Information Technology and the Department of Mathematics and Informatics, led the way to stimulate discussions, exchange of ideas and sharing of experiences.

A number of public lectures from visiting speakers on The sixth edition of the international Week 2019, “From International Higher Education to Global Citizenship”, being organized by the University of Lucian Blaga (13-17 May) also provided immense knowledge and food for thought in new directions. Access to collections at the department library and online databases also became an important resource that supported the research process.

The fellowship at the Research Center on Informatics and Information Technology and the Department of Mathematics and Informatics of the University of Lucian Blaga have an added experiential value for me, as a researcher being incorporated at different instances when returning to her home institution. The most value-added inputs are being put in conferences and publications. The learning from this professional mobility is also being useful in developing future research projects and directions.

Comments of Supervisor

The Eugen Ionescu fellowship of Dr. Soraya Sedkaoui was a very fruitful one. Dr. Soraya Sedkaoui integrated very well in the team of the ITI Research Center. She contributed, as reviewer, to the organization of the international conference ICDD 2019. One of the results of her research activity is an article submitted to the International Conference on Modelling and Development of Intelligent Systems, to be held between 3-5 October in Sibiu. She was interested also in Romanian culture and language. The present fellowship built new bridges between ULB Sibiu and the University of Khemis Miliana, Algeria. Together with Soraya, we plan to develop future cooperation agreements between our universities.

Acknowledgement

In the hope that this end-of-term report will usefully take into account all the tasks and scientific activities carried out throughout this period, I would like to thank, in particular, Pr. Dana Simian, for the confidence she has shown in granting me this postdoctoral fellowship, as well as for all the opportunities for evolution that she offered me.

Many thanks also to Raluca-Mihaela Roca and Andreea-Simina Raulea who were always so helpful and provided me with their assistance throughout my fellowship. I gratefully acknowledge the funding received towards my postdoctoral fellowship from the Agence Universitaire de Francophone (AUF), Bureau Europe Centrale et Orientale (BECO). Big thanks to Elena Floroiu and Ana Maria Bodgros.

For me, one of the best parts of this postdoctoral fellowship has been meeting so many outstanding people at Lucian Blaga University. Your supports and help made this fellowship valuable.