Simona Fioretto

Enhancing Public Administration Services Through In-Depth Analysis of Process Mining Techniques

Tutor: Elio Masciari

Cycle: XXXVIII   Year: First

My background

- MSc Degree in Management Engineering @DII – Federico II
- Research group:
  - PICUS lab
- PhD starting date:
  - 01/11/2022
- Scholarship type:
  - PNRR - DM 351 Public Administration

Research field of interest

- The research activity is centered on the application of **machine learning** methodologies within the context of **public administration**. Its primary objective is to optimize the delivery of services.

- The quality of the services provided by the public administration is inherently linked to the effectiveness and efficiency of the underlying **business processes**.

- The incorporation of **process mining** solutions is instrumental in facilitating the extraction of valuable insights from data. These insights, in turn, can be leveraged to acquire a comprehensive understanding of the processes at hand, thereby enhancing the overall operational knowledge.

Summary of study activities

- **Ad hoc PhD courses**:

  - How to boost your PhD

  - Statistical Data Analysis for science and engineering research

  - I pilastri della trasformazione digitale

  - Academic Entrepreneurship

  - Scienza moderna e disciplina giuridica dell'intelligenza artificiale

- **Courses borrowed from MSc curricula**:
  - attended "Statistical Learning and Data Mining"
- **PhD school**:
  - Software Engineering @Salerno Week
- **Conferences / events attended:**
  - 31st Symposium on Advanced Database Systems (SEBD2023) for the presentation of the papers: "Business process extraction from documents with AI" and "Introducing AI-Based Techniques in the Justice Sector: A Proposal for Digital Transformation of Court Offices"
  - 27th European Conference on Advances in Databases and Information Systems for the presentation of the paper: "Process Mining solutions for public administration"
- **Planned conferences:**
  - 5th International Conference on Process Mining, 23-27 October 2023

itee PhD
information technology
electrical engineering

Research activity: Overview

- **Problem:**
  - Public administrations encounter challenges in the efficient and effective provision of services.
    - This is due to poor management of internal business processes

- **Objective:**
  - Explore the use of *process mining solutions* that use event log for extracting information on the real execution of the process in order to provide knowledge about the weaknesses within these processes

Research activity: Overview

- **Methodology:**
  - Identification of *public administration issues* through on-site analysis.
    - Involvement in projects related to the digitalization of public administration, specifically focusing on the justice sector.
  - Development of a *process mining application model* aimed at enhancing service quality:
    - a. Identification of the most suitable type of process mining for service improvement → *predictive process mining*
    - b. Evaluation and comparison of statistical and machine learning solutions for predictive process mining.

Products

[P1]	Arianna Anniciello, **Simona Fioretto**, Elio Masciari, Enea Vincenzo Napolitano: Covid-19 impact on health information technology: the rapid rise of e-Health and Big Data driven innovation of healthcare processes. BIBM 2022: 2759-2764
[P2]	**Simona Fioretto**: Business Process Extraction from Documents with AI. SEBD 2023: 697-702
[P3]	Flora Amato, **Simona Fioretto**, Eugenio Forgillo, Elio Masciari, Nicola Mazzocca, Sabrina Merola, Enea Vincenzo Napolitano: Introducing AI-Based Techniques in the Justice Sector: A Proposal for Digital Transformation of Court Offices. SEBD 2023: 497-504
[P4]	Enea Vincenzo Napolitano, **Simona Fioretto**, Elio Masciari, Arianna Anniciello: How Pandemic Affected the Adoption of e-Health Systems. IDEAS 2023: 94-98
[P5]	Flora Amato, **Simona Fioretto**, Eugenio Forgillo, Elio Masciari, Nicola Mazzocca, Sabrina Merola, Enea Vincenzo Napolitano: Evolving Justice Sector: An Innovative Proposal for Introducing AI-Based Techniques in Court Offices. EGOVIS 2023: 75-88
[P6]	**Simona Fioretto**: Process Mining Solutions for Public Administration. ADBIS (Short Papers) 2023: 668-675
[P7]	**Simona Fioretto**, Elio Masciari, Enea Vincenzo Napolitano, "A Joint Analysis of Trajectory Mining and Process Mining for Smartphone User Behaviour, " 2023 NFMCP

Next Year

Definition of the object to predict according to the needs of the public administration

Establishment of the prediction technique to be used for predictive process mining

Application of the chosen techniques in the field of public administration

Thank you for your attention