Unlocking the Future of Big Data

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FutureData4EU
Training Future Big Data Experts for Europe

Università degli Studi di Ferrara
Alma Mater Studiorum Università di Bologna
Università Cattolica del Sacro Cuore
Università degli Studi di Modena e Reggio Emilia
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Unlocking the Future of Big Data - Summary

- General overview of the Thematic Area Culture, Creativity and Inclusive Society
- List of the Doctoral Positions and Universities involved in the Thematic Area
- Sub Areas of Research to be developed during the project
- Contacts
Overview of the Thematic Area

Objectives

Human-centred overarching goals: **enhancement, assistance, empowerment, and critical thinking**

- Broader, more inclusive, and multi-modal access to cultural resources
- Enhance research methodologies and self-learning by exploiting the ever-increasing amount of data relevant to humanities
- Enhance multi-modal creativity by generative approaches
- Conversely, investigate the role of the professional, as well as the ethical issues, the potential biases and unfairness of decisions in workflows that are increasingly dependent on AI and Big Data Analytics

Adopted methodologies

- Unsupervised and supervised data analysis
- Big Data preprocessing and Big Data Analytics through state-of-the-art Big Data stacks
- Machine Learning, and Deep Learning
- Computational logic, hybrid and neuro-symbolic approaches
- Explainable AI
List of the Doctoral Positions and Universities involved

Culture, Creativity and inclusive Society (9 total)

6 UNIBO
- Architecture: Critical Theory and Practice in the Age of AI
- Enhancing cultural heritage with generative AI and Big Data
- Normative Reasoning and Fairness in Explainable AI for an Inclusive Society
- Data Analytics and AI for supporting legislative assistance at WIPO: a neuro-symbolic approach
- Large Language Models for a personalised access to large cultural data
- Generative Artificial Intelligence and Creativity

1 UNIFE
- Exploring Lithic Tool Evolution: Big Data & Morphometrics in Prehistorical Archaeology

2 UNIMORE
- Training academic language skills in the age of AI
- Big Data Analysis and Practical Reasoning for Religious Conflict Resolution
Sub Areas of Research to be developed during the project

- **Architecture: Critical Theory and Practice in the Age of AI**
  - Architecture and agency
  - Architecture between art, legislation, conservation and digital media
  - AI’s threat to the sovereignty of architect as master builder
  - AI & democratic space
  - Historical transformation of the profession of the architect since its emergence in the 15th century
  - Aesthetics of sustainability, futures and utopias
  - AI, ethics and memory
  - Post-Anthropocene the concept of history

- **Big Data Analysis and Practical Reasoning for Religious Conflict Resolution**
  - Database of normative texts from various religious traditions, legal systems, and philosophical discourses
  - Text mining, sentiment analysis, and network analysis, to analyze patterns, norms, and principles relevant to religious conflict dynamics
  - Practical reasoning strategies and decision-making frameworks conducive to constructive dialogue, negotiation, and consensus-building in religious conflict mediation

- **Data Analysis**
  - Unsupervised & supervised data analysis
  - Big Data Analytics

- **NLP**
  - Large Language Models
  - Generative AI

- **Architecture: Critical Theory and Practice in the Age of AI**

- **Generative Artificial Intelligence and Creativity**
  - LLM for a personalised access to large cultural data

- **Data Analytics and AI for supporting legislative assistance at WIPO**
  - Normative Reasoning and Fairness in Explainable AI for an Inclusive Society
    - Explainability and fairness of judicial decisions using judicial case-based reasoners
    - A critical investigation of various forms of fairness and of normative explainability within formal argumentation frameworks
    - Explaining legal conclusions in rule-based systems that incorporate deontic concepts
    - Formal models to implement procedures of the AI Act, such as the fundamental right impact assessment
    - Ethical Implications of using XAI in normative domains

- **Exploring Lithic Tool Evolution: Big Data & Morphometrics in Prehistorical Archaeology**

- **Training academic language skills in the age of AI**

- **Enhancing cultural heritage with generative AI and Big Data**

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