



**PHD PROGRAMME IN NATIONAL PHD ARTIFICIAL INTELLIGENCE
ACADEMIC YEAR 2022/2023 (38° CYCLE)**

President professor Dino Pedreschi

Department: Dipartimento di Informatica - Largo Bruno Pontecorvo 3 56127 Pisa

Outcome of the selection procedure:

Ranking of candidates for the whole PhD programme

PHD POSITIONS WITH GRANT AVAILABLE 24

Details:

- 6 PNRR, M4 C2 I 1.3 Partenariato Esteso Future Artificial Intelligence Research- FAIR Spoke 1 “Human-centered AI” (CUP: I53C22001380006) on the subject “*Human-centered AI. The aim is to build the foundations of Human-centered AI along three main goals: a) “human-in-the-loop” machine learning and reasoning: allowing humans to understand and steer learning and reasoning of AI systems and interact synergistically to solve complex tasks. Specific goals include explainable AI, neuro-symbolic learning and lifelong learning for complex data, all with the “human-in-the-loop”; b) social-aware AI: understanding and governing the societal outcomes of large-scale, networked socio-technical systems of humans and AIs, e.g., social media and online marketplaces. Specific goals include modeling such systems and decentralized networked learning; c) design of trustworthy AI systems: the responsible (co-)design, development, validation and use of trustworthy AI systems, including certification, to make sure to incorporate “by-design” European laws, ethical values and human rights. Extensive empirical experiments, case studies and pilots of Human-centered AI systems are integral part of the research plan. The goals will contribute to transversal topics Learning and Reasoning from individual to communities to Society, Frontiers of Machine Learning, Legal & Ethical Design for Trustworthy AI systems, with a strong multidisciplinary focus and synergies between AI and human-computer interaction, cognitive sciences, complex systems, mathematics, ethics, law, and social sciences*”
- 1 PNRR: PE1 - Future Artificial Intelligence Research- FAIR – grant financed by Scuola Normale Superiore di Pisa Spoke 1 “Human-centered AI” (CUP: E53C22001610006) on the subject “*Hybrid human-AI systems: theory, methods and use cases spanning over the following challenges: i) conversational explainable AI, human-AI interfaces supporting interaction and argumentation between humans and AI assistants in complex tasks; ii) engaging users with factual, counterfactual and other high-level explanations (logical, causal, knowledge graph) encoding domain knowledge and user background; iii) novel self-aware ML models that “know what they don’t know”, that are capable to recognize when and why to defer decisions to humans and interacting with human cognition both at intuitive (system1) and rational (system2) level*” *
- 1 PNRR PE1 - Future Artificial Intelligence Research- FAIR – grant financed by IIT CNR Spoke 1 “Human-centered AI” (CUP: B53C22003630006) on the subject “*Modelling and optimisation of collaboration between humans and AI in hybrid human-AI systems*” *
- 1 PNRR: PE1 - Future Artificial Intelligence Research- FAIR – grant financed by IIT del CNR di Pisa Spoke 1 “Human-centered AI” (CUP:

B53C22003630006) on the subject “*Causality-aware AI and causal experiments in human-centric pervasive systems*” *

1 PNRR: PE1 - Future Artificial Intelligence Research- FAIR – grant financed by Università di Trento Spoke 2 “Integrative AI” (CUP: E63C22002110007) sul tema “*Human-Machine Decision Making*”*

1 PNRR: “Infrastrutture di ricerca” Infrastruttura di Ricerca – SoBigData – grant financed by Istituto IIT del CNR di Pisa (CUP: B53C22001760006) on the subject “*BigData analysis in Online Social Networks for a Human-centric Metaverse*”*

1 PNRR: CN - “Agritech” N - “Agritech” Spoke 3 - “Enabling Technologies and sustainable strategies for the smart management of agricultural system and their environmental impact” (CUP: B83C22002840001) on the subject “*AI and big-data analytics for the sustainability of production systems*”

1 PNRR, M4 C2 I 1.3 Partenariato Esteso HEAL ITALIA - Health Extended Alliance for Innovative Therapies, Advanced Lab-research, and Integrated Approaches of Precision Medicine. Spoke 2 Intelligent Health (CUP: I53C22001440006) on the subject “*Development of an AI-powered medical image system to support diagnostic and radiation protection in chest computed tomography (CT)*”

1 PNRR, M4 C2 I 3.1 Infrastrutture di ricerca e innovazione, SEE LIFE - StrEngthEning the ItALian InFrastructure of Euro-bioimaging (CUP: B53C22001810006) on the subject “*AI-based image reconstruction and data analysis for multimodality molecular imaging applications within the Eurobioimaging research infrastructure (SEE-LIFE)*”

2 PNRR IR - Infrastruttura di Ricerca “ITSERR” - Italian Strengthening of the ESFRI RI RESILIENCE – grants financed by Università di Modena e Reggio Emilia (CUP: B53C22001770006) on the subject “*Computer Vision and NLP Technologies for Analysis, Understanding, and Generation in Cultural Heritage*”*

2 PNRR IR - Infrastruttura di Ricerca “ITSERR” - Italian Strengthening of the ESFRI RI RESILIENCE – grants financed by Istituto ISTI-CNR di Pisa (CUP: B53C22001770006) on the subject “*Artificial intelligence for the analysis of multimedia or textual data*”*

1 PNRR, CN1 - ICSC Centro Nazionale di Ricerca in HPC, Big Data e Quantum Computing – grant financed by INFN – Spoke 8 “Pervasive AI” (CUP: I53C21000340006) on the subject “*Development of machine learning algorithms for medical data analysis*”*

1 PNRR, PE1 - Future Artificial Intelligence Research- FAIR – grant financed by Università di Bologna – Spoke 8 “Pervasive AI” (CUP: J33C22002830006) on the subject “*Artificial Intelligence Systems for Personalized Education*”*

2 PNRR PE1 - Future Artificial Intelligence Research- FAIR – grants financed by Università di Bologna - Spoke n. 8 “Pervasive AI” (CUP: J33C22002830006) on the subject “*Explainability through Norms and Argumentation*”*

1 PNRR, PE1 - Future Artificial Intelligence Research- FAIR – grant financed by Università di Bologna – Spoke 8 “Pervasive AI” (CUP: J33C22002830006) on the subject “*Ethic-driven AI for City Digital Twins*”*

1 PNRR, PE1 - Future Artificial Intelligence Research- FAIR – grant financed by Università di Bologna – Spoke 8 “Pervasive AI” (CUP: J33C22002830006) on the subject “*Hybrid approaches (knowledge and learning based) for non-concrete object recognition in creative artefacts and development of a prototype assistant for human-AI cooperation in the music creative process*”*

* The aforementioned PhD grants are to be considered as conditional upon of the relevant agreements completion with the co-financing bodies.

The number of grants may be increased following further available external funding. The increase of these grants will be formalized with Rector's decrees published on the page <http://www.unipi.it/concorsodottorato>.

Admission Requirements: All Master’s degrees

<p>Academic qualification to be obtained by 28 February 2023 (in the event the academic qualification has not been obtained yet, please annex the list of exams and relative marks)</p>	<p>Please note: In this regard, the candidate is required to annex, during the online registration procedure for the call, a self-certification relating to the degree obtained or to be obtained (pursuant to and for the purposes of Presidential Decree no. 445 / 2000) as per Annex 1 being an integral part of the call.</p>
<p>Selection criteria:</p>	
<p>Curriculum</p>	<p>The curriculum, signed and accompanied by a copy of a valid identification document, must be uploaded only during the application process. The curriculum must provide information about the candidate's academic education as well as his/her professional and research experience. <u>The candidate must attach any document useful for the assessment of his/her curriculum.</u></p> <p>The candidate who intends to submit to the evaluation of the Selection Board any document related to his/her academic records held at the University of Pisa, must make an explicit request of acquisition "through office" in the aforementioned curriculum.</p> <p><u>During the online application process,</u> the candidate is also required to indicate, the names and contacts (email address and phone number) of 2 professor or scholar/researcher available to provide and upload references by 3 February 2023 23.59 (Italian Time), following the instructions directly provided via e-mail to the professor or scholar/researcher.</p> <p>Minimum grade: 36 out of 60</p>
<p>Interview</p>	<p>The interview will assess the candidates' knowledge, their aptitude for research, openness to academic experiences in Italy and abroad, and their interest in scientific deepening.</p> <p>During the interview, the Examination Committee will verify candidates' English language proficiency.</p> <p>Minimum grade: 36 out of 60</p> <p>Only online Interview</p>
<p>Guidelines for the presentation of the PhD Research project</p>	<p>Required: YES</p> <p>to be evaluated together with the curriculum and to be illustrated at the interview</p> <p>The candidate must upload the research project during the online application process by the deadline of the announcement. In order to highlight the capacity to carry out the project, the research project will be evaluated together with the curriculum and the candidate discuss it during the interview.</p> <p>The research project is aimed at assessing the candidate's propensity to research activity and their awareness regarding the challenges of multi-disciplinary research and innovation in Artificial Intelligence (AI), both towards innovative applications of AI in society and in devising new tools and theories for future AI. The submitted project should therefore briefly outline the research questions addressed, contextualising them within the aforementioned challenges and the state of the art. The paper should not exceed the limit of 9000 characters (including spaces), corresponding to approximately two pages (excluding the bibliography). For the purpose of candidate orientation, further information on both specific topic grants and</p>

	<p>the general topic "AI and Society" is available on the University of Pisa's National PhD in AI website https://phd-ai-society.di.unipi.it/en/.</p>
Test schedules	<p>The tests will take place between 7 and 17 February 2023. The test schedule and venue will be published on January, 31st 2023 at http://dottorato.unipi.it/ - "Admission".</p> <p>The list of candidates who are invited to take an interview will be published at http://dottorato.unipi.it/ "Admissions" should take place before the written examination/interview.</p>
INFO:	<p>Overview and objectives of the PhD course: https://phd-ai-society.di.unipi.it/</p> <p>Website: https://phd-ai-society.di.unipi.it/</p> <p>For the purpose of candidate orientation, further information on the admission procedure, the topic grants and the reference professors is available on the University of Pisa's National PhD in AI website https://phd-ai-society.di.unipi.it/en/</p>

ANNEX

PHD PROGRAMME – ACADEMIC YEAR 2022/23

I, the undersigned, [surname]_____ [name]_____ born in _____ date _____, with reference to the call for _____.

declare

to express the following preferences regarding the venue and any specific research topic of the PhD grant available for the National Doctorate in Artificial Intelligence.

[entering in the boxes a number from 1 to 3 to indicate the preferences and the corresponding order]

- Avviso PNRR, M4 C2 Investimento 1.3 Partenariato Esteso Future Artificial Intelligence sul tema *“Human-centered AI...”*
- Scuola Normale Superiore di Pisa sul tema *“Hybrid human-AI systems...”*
- IIT CNR sul tema *“Modelling and optimisation of collaboration between humans and AI in hybrid human-AI systems”*
- IIT CNR di Pisa sul tema *“Causality-aware AI and causal experiments in human-centric pervasive systems”*
- Università di Trento sul tema *“Human-Machine Decision Making”*
- IIT CNR di Pisa sul tema *“BigData analysis in Online Social Networks for a Humancentric Metaverse”*
- Avviso PNRR: CN - “Agritech” sul tema *“AI and big-data analytics for the sustainability of production systems”*
- Avviso PNRR, M4 C2 Investimento 1.3 Partenariato Esteso HEAL ITALIA sul tema *“Development of an AI-powered medical image system to support diagnostic and radiation protection in chest computed tomography (CT)”*
- Avviso PNRR, M4 C2 Investimento 3.1 Infrastrutture di ricerca e innovazione, SEE LIFE sul tema *“AI-based image reconstruction and data analysis for multimodality molecular imaging applications within the Eurobioimaging research infrastructure (SEE-LIFE)”*
- Università di Modena e Reggio Emilia sul tema *“Computer Vision and NLP Technologies for Analysis, Understanding, and Generation in Cultural Heritage”*
- ISTI-CNR di Pisa sul tema *“Artificial intelligence for the analysis of multimedia or textual data”*

- INFN sul tema *“Development of machine learning algorithms for medical data analysis”*
- Università di Bologna sul tema *“Artificial Intelligence Systems for Personalized Education”*
- Università di Bologna sul tema *“Explainability through Norms and Argumentation”*
- Università di Bologna sul tema *“Ethic-driven AI for City Digital Twins”*
- Università di Bologna sul tema *“Hybrid approaches (knowledge and learning based) for non-concrete object recognition in creative artefacts and development of a prototype assistant for human-AI cooperation in the music creative process”*

Data

Firma