PHD PROGRAMME TABLE
Announcements of competition for admission to PhD Courses
41st cycle, Academic Year 2025/2026

PhD Course: COMPUTER AND DATA SCIENCE FOR TECHNOLOGICAL AND SOCIAL INNOVATION
Available positions: 12
Evaluation Methods: based on academic and research records and interview

The Course provides for two selective procedures depending on the type of positions available. Candidates interested in more than one selection procedure must submit an application and pay the relevant fee of € 25.00 for each procedure in which they wish to participate.
The selections are intended to verify the candidate's preparation and aptitude for conducting research activities related to the topics of the PhD Course.

Available positions:

Selection	Place n.	Description	Financial support	Specific research topic
Selection 1	1	Scholarship	University scholarship	-
Selection 1	2	Scholarship	University scholarship funded by Fondazione di Modena	-
Selection 1	3	Scholarship	University scholarship funded by Fondazione di Modena	-
Selection 1	4	Reserved position*	Three-year high apprenticeship contract funded by HIPERT S.R.L.	Perception Algorithms for Multi-Sensor Systems Including Cameras, LiDAR, and RADAR for Navigation in Unstructured Environments with a Focus on Off-road Perception
Selection 1	5	Reserved position**	Three-year high apprenticeship contract funded by MINERVA SYSTEMS S.R.L.	Time-Sensitive Networking and Operating Systems
Selection 1	6	Position without scholarship		
Selection 1	7	Position without scholarship		
Selection 1	8	Position without scholarship		
Selection 2	9	Scholarship	Scholarship funded by HIPERT SRL	Efficient 3D Scene Compression and Rendering for Real-Time Applications
Selection 2	10	Scholarship	Scholarship funded by HIPERT SRL	Autonomous driving algorithms for urban and racing vehicles

Selection 2	11	Scholarship	Scholarship funded by Department of Physics, Informatics and Mathematics	Smart perception and control for robotic picking in industrial systems
Selection 2	12	Scholarship	Scholarship funded by Emilia Romagna Region in implementation of the program “High-Level Skills to Address the Challenges of the Technological, Cultural, Economic, and Social Transition Towards Sustainability”- PR ESF+ 2021/2027 CUP E83C25002380002	Complexity balance for Safe, Robust and Fast Autonomous Driving Algorithms

*****: Reserved position funded by **Hipert S.r.l.** for a three-year High Apprenticeship Contract aimed to carry out work, training, and research activities on the subject of “Perception”, with the following focus: perception algorithms for various sensors such as cameras, LiDAR, and RADAR, aimed at navigation in unstructured environments, with a particular emphasis on off-road perception.
The contract can only be signed by candidates who are under 30 at the time of signing.
The apprentice will be hired at the Company's location in Modena, via della Scienza 50 with a functional qualification equal to entry level clerk at level 3 - software programmer and exit level at level 5, full-time and with application of the regulatory and economic treatment required by the current Italian National Contract (CCNL) for the Confapi metal-mechanical sector, the Company is part of;

******: Reserved position funded by **Minerva Systems S.r.l.** for a three-year High Apprenticeship Contract aimed to carry out work, training, and research activities on the subject of system-level software technologies for embedded platforms applicable in critical environments, with particular reference to flexible support for Time-Sensitive Networking (TSN) communication protocols.
The apprentice will be hired at the Company's plant located in Modena, via Nicolò dell'Abate, with a functional qualification equal to 3rd level clerk, full-time and with application of the regulatory and economic treatment required by the current Italian National Contract (CCNL) for the Confapi small industry metalworking sector, the Company is part of;

Areas of the PhD Programme: The PhD Programme in Computer and Data Science for Technological and Social Innovation (CDS-TSI) is designed to provide a high-level educational path across various fields of Computer Science, with particular emphasis on applications of Data Science. Thanks to a faculty board with strong multidisciplinary expertise, an extensive network of national and international collaborations, long-standing partnerships with industrial stakeholders, and participation in numerous funded research projects, the CDS-TSI PhD Program aims to train highly qualified professionals through a curriculum offering both solid technical competencies and transversal soft skills.

The educational offering is structured to cover both theoretical and practical aspects related to (i) enabling computer technologies and (ii) cutting-edge and emerging application domains, enhancing the synergy between scientific and social disciplines. Key enabling technologies include distributed and parallel systems (high-performance embedded systems and High-Performance Computing; Internet of Things and edge-fog-cloud computing paradigms; complex systems modeling); scalable Data Analytics (algorithms and techniques for managing and analyzing big data); and Cybersecurity.
The application domains of interest are broad and deeply rooted in the digital transformation of both social (recommendation systems, sharing economy, social contagion and viral marketing, human-machine interaction, business ethics, natural language modeling,

business analytics, digital preparedness) and technological sectors (Industry 4.0, autonomic computing for collective self-adaptive systems, autonomous driving systems and Connected Shared Mobility, clinical medicine).

Admission requirements (for every selective procedure):

Italian second cycle master's degree ("Laurea Magistrale", under D.M. 270/04 or "Laurea Specialistica", under D.M. 509/99) or Italian degree obtained prior to D.M. 509/99 (the previous Italian regulations) or Second cycle non-Italian Master's degree, equivalent to the Italian degrees mentioned above, in accordance with Article 2 of this Call.

Documents to be attached to the application (for every selective procedure):

1) degree certificate (or self-certification for Italian degrees) and Transcript of Records including the full list of examinations with corresponding marks. Applicants with a non-Italian degree must attach their certificate (including the full list of examinations with corresponding marks) and a legalized translation or Diploma Supplement and, if available, the Declaration of Value ("Dichiarazione di Valore in loco") issued by the competent Italian diplomatic-consular Representation, or the certificates issued by the CIMEA - ENIC-NARIC centre. If the degree certificate is not yet available or if the degree has not yet been obtained, the candidate must attach a description of the degree with a list of the examinations taken using Annex A;
2) a curriculum vitae including their scientific and teaching activities in Italian or English using the form in Annex B; the CV must include the university-level qualifications held;
3) a summary, in Italian or English, of the Master's thesis (or equivalent), consisting of a minimum of three and a maximum of six pages, and structured as follows: motivations behind the thesis, research methods, and results achieved;
4) a short text in English (Statement of Research Interest) using the form in Annex C, in which the candidate illustrates her/his motivation for attending the Course and the description of her/his specific research interests; the candidate must select a specific research topic from those available on the PhD Programme website (table (a) for open-topic scholarship and table (c) for advanced training apprenticeships on this page https://www.cds.unimore.it/tesi-di-ricerca/), optionally indicating a second choice in addition to the main one.
   PLEASE NOTE: for the **Selection 2** candidates applying for more than one specific research topic post must submit a short text in English (Statement of Research Interest - Annex C) for each selected topic;
5) certificates of English competence (TOEFL, CAE/Proficiency or others);
6) certificate of completion of the GRE (Graduate Record Examination) test;
7) maximum three letters of introduction/recommendation/reference; in the online application, applicants must enter all the personal details of the professor/researcher/expert who will be sending the letter of recommendation. Once the application has been submitted, the computer system will send an automatic e-mail to the contact person requesting the letter of recommendation. The deadline for uploading letters is June 30th 2025, 11.59 pm (CET); applicants can check on the application summary page whether the contact person has sent the cover letter/recommendation. Within the aforementioned deadline, applicants may send a reminder to the contact person who has not yet done so by selecting the 'reminder' item from the application summary page;

8) any other document considered useful for the candidate's assessment and/or scientific publications; candidates must provide a full list of all the documents and publications attached;
9) a copy of a valid identity document.

Additional documents to be attached for Selection 1:

10) Candidates who wish to apply with priority for the reserved position linked to one of the three-year Higher Education Apprenticeship Contracts must indicate their interest by attaching Annex E of this call for applications to their online application.

Evaluation Criteria:

Selection 1:

In the evaluation of candidates' qualifications, the Selection Committee assigns scores up to a total of 120 points, as follows:

- Academic and research records: from 0 to 60 points

- Curriculum vitae of studies and congruity of the exams taken and the topics of the dissertation respect to the PhD topics: from 0 to 30 points;
- Publications, conference presentations, patents: from 0 to 10 points;
- Statement of Research Interest on the selected topic to assess his/her motivation and aptitude for research: from 0 to 10 points;
- Other qualifications (certification of proficiency in English, letters of introduction, study periods abroad, research grants or other collaborations with research groups, etc.): from 0 to 10 points.

Candidates will be admitted to the interview if the evaluation of their academic and research qualifications has reached a score of at least 35 points out of the 60 available.

The list of the candidates admitted to the interview, and any variation in the selection procedure, will be published by July 15th, 2025 at the following University website address: https://www.unimore.it/en/bando-phd-41.

- **Interview:** from 0 to 60 points

The interview will focus on the description of a hypothetical research project of the candidate's choice among the theses and topics offered by the course (https://www.cds.unimore.it/tesi-di-ricerca/). The assessment will focus on the project's scientific soundness, feasibility and congruity with the themes of the PhD course.

Any publications by the candidate will also be discussed. Part of the interview will be conducted in English.

Minimum score for passing the interview: 40 points

The Committee will evaluate and determine eligibility only for candidates who have expressed their interest in applying with priority for the reserved position covered by a high apprenticeship contract at **Hipert S.r.l.**, based on the following evaluable criteria:

- Proven experience in the research topic proposed;
- Work experience relevant to the research topics.

Assessment of candidates' suitability for the position covered with a three-year high apprenticeship contract will not affect the marks awarded to the candidates, but is necessary to attribute the contract to suitable candidates. The contractual position will be allocated, to the candidate with the highest score in the ranking list among those who have expressed priority interest for the contract and have been deemed suitable for the position.

The Committee will evaluate and determine eligibility only for candidates who have expressed their interest in applying with priority for the reserved position covered by a high apprenticeship contract at **Minerva Systems S.r.l.**, based on the following evaluable criteria:
-Master's degree (or equivalent qualification) in Computer Science;
-Knowledge in the field of embedded systems and/or high-performance systems;
-Knowledge in system-level development, e.g., kernel and driver development, C programming;
-Work experience relevant to the research topics.
Assessment of candidates' suitability for the position covered with a three-year high apprenticeship contract will not affect the marks awarded to the candidates, but is necessary to attribute the contract to suitable candidates. The contractual position will be allocated, to the candidate with the highest score in the ranking list among those who have expressed priority interest for the contract and have been deemed suitable for the position.

Selection 2:

In the evaluation of candidates' qualifications, the Selection Committee assigns scores up to a total of 120 points, as follows:
- Academic and research records: from 0 to 60 points
- Curriculum vitae of studies and congruity of the exams taken and the topics of the dissertation respect to the PhD topics: from 0 to 30 points;
- Publications, conference presentations, patents: from 0 to 10 points;
- Statement of Research Interest on the selected topic to assess his/her motivation and aptitude for research: from 0 to 10 points;
- Other qualifications (certification of proficiency in English, letters of introduction, study periods abroad, research grants or other collaborations with research groups, etc.): from 0 to 10 points.

Candidates will be admitted to the interview if the evaluation of their presented qualifications has reached a score of at least 35 points out of the 60 available.
The list of the candidates admitted to the interview, and any variation in the selection procedure, will be published by July 15th, 2025 at the following University website address: https://www.unimore.it/en/bando-phd-41.

- **Interview:** from 0 to 60 points
The interview will focus on demonstrable experience in one of the four topics proposed in the call for applications, and on the description of a hypothetical research project (Statement of Research Interest) chosen by the candidate from among the topics offered by the course specifically for this selection (table (b) on page https://www.cds.unimore.it/tesi-di-ricerca/).
The assessment will focus on the project's scientific validity, feasibility and congruity with the themes of the PhD course.
Any publications by the candidate will also be discussed. Part of the interview will be conducted in English.
Minimum score for passing the interview: 40 points

Once the evaluation of the qualifications and the interview have been completed, the Commission will draw up a merit-based ranking list for each selection on the basis of the marks awarded to the candidates.
Candidates who obtain a minimum score of 80/120 are deemed eligible.

INTERVIEW SCHEDULE (for every selective procedure)

In-person interview: July 17th, 2025 at 9:00 a.m. Interviews could continue on July 18th, 2025 at 9:00 a.m., should there be a high number of candidates. The test will take place at the premises of the Department of Physical, Computer and Mathematical Sciences, Via Giuseppe Campi 213/A, Modena (the classroom will be communicated at the same time as the results of the selection based on qualifications).

Remote interview (allowed for each candidate, regardless of residence): **July 17th, 2025, after the in-person interviews**. The precise timetable will be established following the selection procedure on the basis of academic and research records. Interviews could continue on July 18th, 2025, after in-person interviews and with an agreed timetable as already specified, should there be a high number of candidates. The test will take place via Microsoft Teams.

The operational indications on how to conduct the interview via Microsoft Teams will be communicated at the time of publication of candidates admitted to the interview.