

PhD in Computer
Science & Artificial
Intelligence

PhD in
Mathematical &
Physical Sciences

University of Udine - Italy

The courses in few figures

- Instituted in 2020 as successors to previous PhD programme in Computer Science, Mathematics & Physics
- Three year duration
- Call: April-May
- Admission: September
- PhD cycle XXXVII, starting November 1st, 2021
- PhD thesis to be submitted by October 31 of 3rd year
- Graduation in spring of the following year

Research Areas – CS & AI

Algorithms
Automata
Logics

Bioinformatics
Medical Informatics

Human-Computer Interaction

Artificial Vision
Real-Time Systems

Data Science
Information Retrieval
Machine Learning

Knowledge Representation
Automated Reasoning

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Research Labs - CS & AI

Laboratory	Supervisors in the Lab	Web Address
Artificial Vision & Real-Time Systems	Gian Luca Foresti (Head) Carlo Drioli, Claudio Piciarelli, Daniele Salvati	avires.dimi.uniud.it
Bioinformatics, Verification & Parallel Computing	Carla Piazza (Head) Alberto Policriti	bioinf.dimi.uniud.it
Constraint Logic Programming	Agostino Dovier (Head)	clp.dimi.uniud.it
Embedded Systems	Alessandro Cimatti (Head)	ict.fbk.eu/units/es/
fast prototyping and delivery of innovative IoT	Massimo Vecchio	https://create-net.fbk.eu/openiot/
Social, Mobile, Data, Crowd	Stefano Mizzaro (Head)	smdc.uniud.it
Data Science	Angelo Montanari (Head) Dario Della Monica Massimo Franceschet Gabriele Puppis	datasciencelab.dimi.uniud.it/en
Human-Computer Interaction	Luca Chittaro (Head) Fabio Buttussi Federico Fontana	hcilab.uniud.it
Machine Learning & Perception	Christian Micheloni (Head) Niki Martinel	machinelearning.uniud.it
Medical Informatics, Telemedicine & eHealth	Vincenzo Della Mea (Head)	mitel.dimi.uniud.it/mitel2/
Software Engineering	Angelo Susi (Head)	se.fbk.eu
3D Optical Metrology	Fabio Remondino (Head)	3dom.fbk.eu/home

Research Areas - Mathematics

Algebra
Topology

Dynamical Systems

Operations Research

Mathematical Logic

Statistics

Algebraic Geometry
Number Theory

Mathematical Analysis

Numerical Analysis

Mathematical methods
of Economy

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Research Areas - **Physics**

Astrophysics

Particle Physics

Semiconductor
and Scintillator-based
Radiation Detectors

Molecular Modeling

Fundamental Interactions

Physics Education

Simulation of
Bio- and Nano-Systems

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Supervisors: CS & AI

Fabio Buttussi, Luca Chittaro - Virtual Reality, Serious Games, Health and Safety, Persuasive Technology, ...

Alessandro Cimatti, Dario Della Monica, Angelo Montanari, Andrea Orlandini, Gabriele Puppis - Temporal logics for computer science and its applications , Spatio-temporal databases, Big data, ...

Vincenzo Della Mea - Medical informatics, Tele-medicine and e-Health

Agostino Dovier - Logic Programming, Knowledge Representation, GPGPUparallelism, ...

Carlo Drioli, Federico Fontana, Michele Geronazzo, Daniele Salvati - Acoustic scene analysis, Interactive Sound Processing, Machine listening, Music Interfaces, Sonic Interaction Design, ...

Gian Luca Foresti, Niki Martinel, Christian Micheloni, Claudio Piciarelli - Computer Vision, Neural Networks, Data and Information Fusion, Cybersecurity, Deep learning, ...

Massimo Franceschet - Network science, Bibliometrics, Logic, Temporal Knowledge, ...

Stefano Mizzaro - Web Information Retrieval, Crowdsourcing, Data Science, Social Computing, ...

Carla Piazza, Alberto Policriti - Formal Verification, Hybrid Systems, Model Checking Algorithms, Systems Biology, Computable Set Theory, Algorithms, Bioinformatics, Computational Biology, ...

Fabio Remondino – 3D Optical Metrology

Giuseppe Serra - Machine Learning, Neural Networks, Pattern Recognition, ...

Angelo Susi – Software engineering, ...

Riccardo Spizzo – Software engineering, ...

Massimo Vecchio – Internet of Things, Fast prototyping, ...

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Supervisors: Mathematics

Michela Battauz – Statistical Boosting; Item response theory, ...

Gianni Bosi – Mathematical methods of economy, finance and actuarial sciences, ...

Dimitri Breda - Numerical Methods; Dynamical Systems, Delay, ...

Sara Ceschia - Local search algorithms for combinatorial optimization, ...

Pietro De Poi - Algebraic Geometry, Commutative Algebra, ...

Vincenzo Dimonte – Set Theory, Large Cardinals, Inner models, ...

Guglielmo Feltrin – Ordinary Differential Equations, Nonlinear analysis, ...

Anna Giordano Bruno - Topological Groups, Algebraic Entropy, Pontryagin Duality, ...

Valentina Mameli – Likelihood asymptotics, Higher-order asymptotics, ...

Alberto Marcone - Reverse Mathematics, Weihrauch Degrees, WQOs and BQOs, ...

Roberta Musina - Nonlinear Analysis, Variational methods, ...

Giovanni Panti – Continued fractions, Dynamical systems, ...

Duccio Papini – Ordinary Differential Equations, Qualitative properties of solutions, ...

Rodica Toader – Calculus of variations, Free discontinuity problems, ...

Stefano Urbinati – Algebraic Geometry, Birational geometry, ...

Rossana Vermiglio – Numerical analysis of delay equations, Numerical stability, ...

Antonino Zanette – Options pricing, Derivatives, Insurance products, ...

Francesco Zucconi – Algebraic Geometry, ...

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Supervisors: **Physics**

Diego Cauz – Experimental Physics, Particle Physics, Astrophysics, ...

Marina Cobal – Fundamental Interactions and Fields, Particle Physics, Accelerators Physics, ...

Barbara De Lotto - Astroparticle Physics, Very High Energy Gamma Astrophysics, ...

Federico Fogolari - Molecular Modeling, Structural Biology, Biomolecular Simulations, ...

Gilberto Giugliarelli – Surface Critical Phenomena, Protein folding models, ...

Alberto Gola – Development of silicon photodetectors and ionizing radiation detectors, ...

Marisa Michellini – Physics Education, Teacher Education, ...

Lorenzo Santi - Particle Physics, Detector R&D; Physics Education, ...

Andrea Vacchi - X-ray and High-Energy Astrophysics, Semiconductor based Detectors Development, ...

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Funding

- Standard scholarship: € 15.343,28 per year
- Supplements per month abroad: € 639 (6 months)
- € 500 for schools and consumables (1st year)
- € 1534,33 for traveling (both 2nd & 3rd year)
- Specific scholarships (Bruno Kessler, companies)
- Other research funds provided by the Supervisor and his/her Lab/Institute



Important figures

- Learning activity ≥ 20 CFU (also “Transversal”)
 - 5 CFU English (Italian courses as well)
 - 4 “Transversal” topics (at least one course for each topic, to be attended downtown at the University)
 - PhD thematic courses (typically 2 or 4+ CFU each)
 - Individual activities (summer schools etc.)
- Teaching activity ≤ 40 hrs each year
- PhD project overall = 1720 hrs each year



Reporting

- Learning activity (CFU)
- Teaching activity (permission needed)
- Dissemination (seminars, conferences)
- Dissemination (articles, papers -> IRIS)
- Extra-project activities (paid or not, permission needed)
- Expenses paid with PhD funds
- Internships
- Suspensions (max one year, personal or family issues **only**)
- Evaluation Day by Oct. 31



PhD Notebook app

- You must insert all you do for your PhD (learning activities, seminars you attend, teaching, etc) in the “PhD Notebook” app.
- You also insert there the yearly description of your research.
- It will eventually generate your annual and final reports.
- We recommend inserting the activities as they happen, to avoid an end-of-the-year rush.
- Everything needs to be approved by your supervisor and will be reviewed by the board.
- Therefore, if you plan to attend learning activities outside those organized by the PhD board, consult your supervisor beforehand: (s)he will need to approve any credits you claim for them.

Scholarships

Year	Funding (CS & AI)			Applications
	University	Industry	EU / Other	
2021	4+2	1	6	38+7
2022	?	?	?	?

Year	Funding (Math & Ph)			Applications
	University	Industry	EU / Other	
2021	4+1	0	1	27+4
2022	?	?	?	?

25% additional positions available without scholarship

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Workplan

1st year

- Attend courses/schools, also organized by the University
- Begin research activity
- End-of-the-year reporting, evaluation (learning activity & research plan)

2nd year

- Conclude the learning activity
- Research activity full immersion
- Teaching
- End-of-the-year reporting, evaluation (learning activity & research activity)

3rd year

- Conclude research and write PhD thesis
- Teaching
- Exhibition at the University (PhD Expo)
- Admission to the final exam (external review of the PhD thesis)

Beginning of the new year: discussion of the thesis, graduation

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Courses for 2021 – CS & AI

Title	Dates	Organizers	CFU
Quantum computing and communication (from the master in CS)	March - June	Federico Fogolari Carla Piazza	4+2 (48 hrs)
Web Information Retrieval (from the master in CS)	March - June	Stefano Mizzaro	4+2 (48 hrs)
Quantum computing for Artificial Intelligence (advanced course at CISM)	June	Carla Piazza Giuseppe Serra	4 + 2 (16 hrs)
Reactive Synthesis: Main Achievements and Current Trend (advanced course at CISM)	June or July	Angelo Montanari Gabriele Puppis	4 + 2 (16 hrs)
Manage your Requirements using AI (advanced course at FBK)	May	Angelo Susi	2 + 2 (8 hrs)
Evaluation metrics for Artificial Intelligence (advanced course at DMIF)	Autumn	Stefano Mizzaro	2 + 2 (8 hrs)
Algorithms and data structures for massive data (basic course at DMIF)	22-26 November (16 hrs) soon!!! 22-25 february (8 hrs)	Alberto Policriti Federico Fontana	4 + 2 (8+16 hrs)
Artificial Intelligence and Machine Learning from the data (basic course at DMIF)	28 feb – 03 mar (8 hrs) spring (16 hrs)	Niki Martinel Federico Fontana	4 + 2 (8+16 hrs)

Courses for 2021 – Math & Physics

Title	Dates	Organizers	CFU
Advanced Statistics (basic course at DMIF)	Dec-Jan	Michela Battauz + Valentina Marnati	4+2 (20 hours)
Transcendence, Diophantine Approximation, and Local Positivity (course funded by INdAM)	Feb-Mar	Stefano Urbinati (teacher Alex Küronya)	4+2 (16 hours)
Memory, past, delay: mathematics and more (basic course at Scuola Superiore)	May-Jun	Dimitri Breda	2 + 2 (14 hours)
From combinatorics to metamathematics (basic course at Scuola Superiore)	Dec-Feb	Alberto Marcone	4+2 (28 hours)
Infinite games and (generic) large cardinals (advanced course at DMIF)	Jan	Vincenzo Dimonte (teacher Peter Holy)	3 (12 hours)

More courses will be announced soon!

Students' representatives in the board

- There will be two students' representatives in each PhD board
- Elections will be called soon
- Davide Castelnovo and Nicola Saccomanno are the current representatives in the board of the «old» PhD

Meet the Department staff

- Silvia Zuccaro (Head of department staff)
- Marina Dorligh (Head of administrative staff)
- Francesca Baciga (Head of research staff)
- Claudia Longhetto (Head of courses administration staff)
- Ines Ovuka (Front desk)
- Chiara Maltese (System administrator, technical issues)
- Federico Teghil (Travels, reimbursement)



Populate the Department web site

Please

- enter into contact with niki.martinel@uniud.it (CS & AI) or dimitri.breda@uniud.it (Math & Ph)
- send: photo & short research project & personal web page (if any)

Inclusion in our web page:

<https://www.dmif.uniud.it/dottorato/dottorandi/>

Ex.:

<https://www.dmif.uniud.it/dottorato/imf/dottorandi/axel.denardin/>

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Additional info

General information, call for PhD:

- www.uniud.it/en/research/research-doctorate/phdstudies
- phd.dimi.uniud.it

Information about Fondazione Bruno Kessler:

- www.fbk.eu/en/

Contacting a supervisor from the PhD Board:

- www.dmif.uniud.it/dottorato/iai/collegio-docenti/
- www.dmif.uniud.it/dottorato/smf/collegio-docenti/

