# Laurea Magistrale in Artificial Intelligence (LM-18 – CLASSE INFORMATICA)





Activation in 2022/23



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### Goals

### To prepare Artificial Intelligence Specialists

able to develop intelligent agents in several application contexts, such as,

ecology, economy, sustainable growth, medicine, industry

Focus on **explainable Artificial Intelligence** (security, interpretability, trustworthyness of AI methods)





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### **Artificial Intelligence in our lives**

### Artificial intelligence plays an increasingly important role in our lives and in the labour market

Self driving cars



Smart Industry



Alpha GO



Smart buildings





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People

80 Academics, 120 PhD students, research associate, 5 Technical staff







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In the last 5 years

3 Horizon 2020 projects, 1 another EU program, 4 projects on other international programs, 62 projects on national programs

Total funding for research projects **4.1 million euro** 

• 290 projects with companies

Total funding for contracts with companies: **5.1 million euro** 

- 6 spin-off
- 10 patents



### **Artificial Intelligence @UniVr: other departments involved**













### AI in action

#### Al for Autonomous Water Monitoring



#### Heat demand forecasting in smart grids



#### AI for Video Surveillance and Monitoring



https://www.youtube.com/watch?v=5HCuvIRkOL0&t=1s

# Layer-wise relevance propagation for ANN explanation (neuro-imaging)





# How can I learn to develop these tecnologies?





Symbolic methods

**Probabilistic methods** 

eXplainable Artificial Intelligence



#### **Decision support systems**

### **Perception and interaction**







Foundational courses (42 CFU)







Planning & Automated Reasoning (12 CFU)



 $\mathbb{R}^2$ 

RN

Reinforcement Learning & Advanced Programming for AI (12 CFU)
Explainable AI (6 CFU)

Image: Comparison of the second s

Theory/Lab time ratio: 1/1



### **Elective courses (4 courses among the following, 24 CFU)**





### **Elective courses (18 CFU) and other activities**

### 2 courses among the following (12 CFU)

**Computational Game Theory** 

AI in Robotics

**Biomedical decision support systems** 

**Discrete Optimization (MAT)** 

**Complex systems (FIS)** 

**Embedded** AI

Logic in AI Continuous Optimization (MAT) Statistical models (MAT) Network Science (FIS) Quantum Computing

**Computational epistemology and philosophy (M-FIL)** 

Diritto costituzionale delle nuove tecnologie (IUS)

**Diritto comparato tecnologie dell'informazione (IUS)** 

**Cybercrime (IUS)** 

1 course among the following (6 CFU)

AI and Finance (SECS-S)

Diritto privato delle nuove tecnologie (IUS)

Intelligenza artificiale e diritto del lavoro (IUS)

Diritto della proprietà intellettuale (IUS)

### **Other activities (36 CFU)**

Other courses (12 CFU - D)

Final project (18 CFU - E)

Stage/Traineeship (6CFU - F)



- 1) Laurea classe L-08: Ingegneria dell'informazione
- 2) Laurea classe L-31: Scienze e tecnologie informatiche
- 3) 60 CFU:
  - INF/01;
  - ING-INF/01, ING-INF/02, ING-INF/03, ING-INF/04, ING-INF/05, ING-INF/06, ING-INF/07
  - FIS/01, FIS/02, FIS/03, FIS/04, FIS/05, FIS/06, FIS/07
  - MAT/01, MAT/02, MAT/03, MAT/04, MAT/05, MAT/06, MAT/07, MAT/08, MAT/09

**English certification: level B2** 

#### UNIVERSITÀ di VERONA LM in Artificial Intelligence and the other master's degrees @UniVr





### **Carrer prospects**

### **Artificial Intelligence Specialist**

Software Engineering Industry



**Environment protection** 



Cybersecurity



**Smart agriculture** 



Logistics

Hospitals

Multimedia industry







Other...

**Banks and insurances** 

**Videogames industry** 





### The need of ICT specialists



**Computer science** and **ICT technologies** degrees represent the **training areas with the greatest demand**, immediately followed by degrees in industrial and information engineering.



### **Stakeholder consultation and media**





Fondazione

Cariverona

ALLESTON

RORTOS 🔶



#### FRANCHETTI BRIDGE DIAGNOSTICS AND PREDICTIVE MAINTENANCE

## L'Arena

#### A MAGISTRALE IN INTELLIGENZA ARTIFICIALI

Dalla guida autonoma ai sistemi IT nelle caldaie

ampio, dal finanziario bancario- finanziario, fino al controllo e prevenzione ambientale. Infatti anche l'agenzia regionale Arpav ha partecipato ai lavori.

ambentale. Intatti anche Tigenzia regionale Arpan ha partecipato ai lavori. Per chi frequenterà sono previsiti atago? Nel biennio una cinquantina di ore saranno dedicate a stage in azened, ma soprattuto dgi studienti lavoretanon molto ne laboratori universitari, nello sviluppo pratico di software, ir coerenza con quanto appreso attraverso gli insegnamenti teorici.

L'importante è acquisire una formazione che abbia applicazioni di ampia gamma, per consentire sbocchi molteplici. Quello che proporiamo, infatti, non è un percorso professionalizzante.







Prof.ssa Maria Paola Bonacina



Prof. Matteo Cristani



Prof. Roberto Giacobazzi



Prof. Vittorio Murino





Dr. Alberto Castellini



Prof. Ferdinando Cicalese



Prof. Paolo Dai Pra



Prof. Alessandro Farinelli



Prof.ssa Gloria Menegaz



Prof.ssa Francesca Monti



Prof. Peter Michael Schuster



# Thank you!