

The course is jointly organized by the



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AI

Master Degree in
**Artificial Intelligence
for Science and Technology**

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Chair of the AI4ST Educational Council
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INTERDISCIPLINAR FOUNDATIONS

Computer Science

Philosophy - Ethics

Mathematics

Statistics

Logic

Law

Physics

Organization Management

AI TECHNIQUES FOR SCIENCE AND TECHNOLOGY APPLICATIONS

Knowledge Extraction

Reasoning

Neural Networks

Machine Learning

Deep Learning

Statistical Learning

Fuzzy Systems

Evolutionary Computing

Decision Support Systems

SCIENTIFIC AND TECHNICAL ASPECTS FOR SCIENCE AND TECHNOLOGY APPLICATIONS

Sensing

Signal and Image Processing

Classification

Modeling

Approximation

Prediction

Control

Quantum Computing

OTHER ASPECTS FOR SCIENCE AND TECHNOLOGY APPLICATIONS

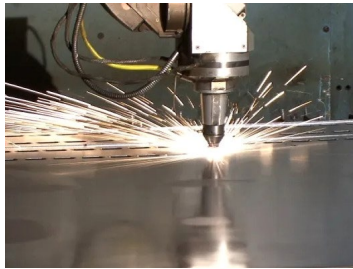
Ethics

Privacy and Data Protection

Law

Data-Driven Organization and Management

SCIENCE AND TECHNOLOGY APPLICATIONS



Industrial Manufacturing



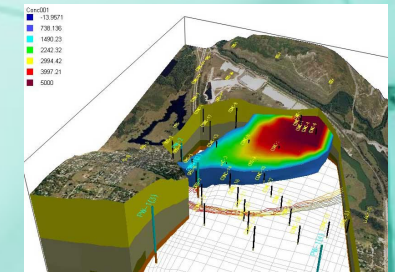
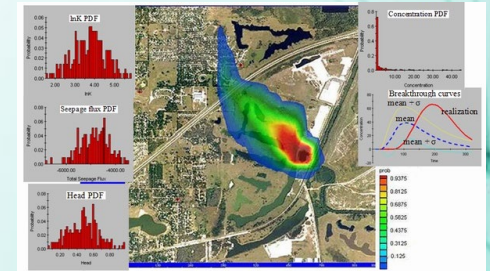
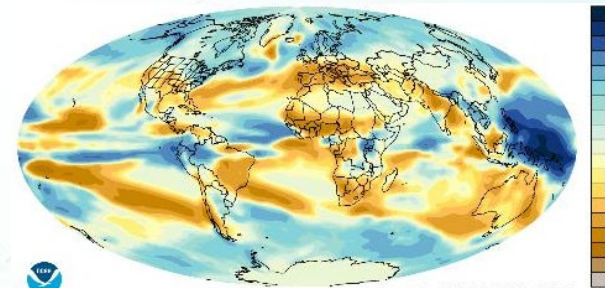
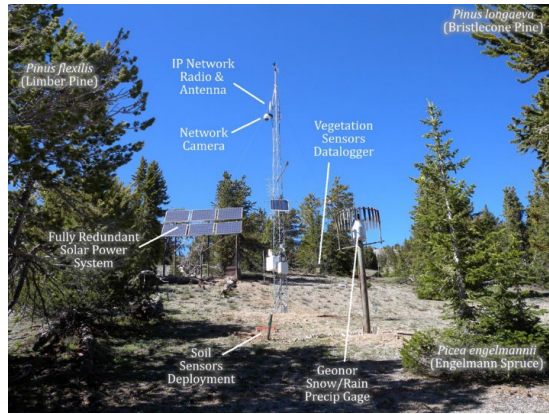
SCIENCE AND TECHNOLOGY APPLICATIONS



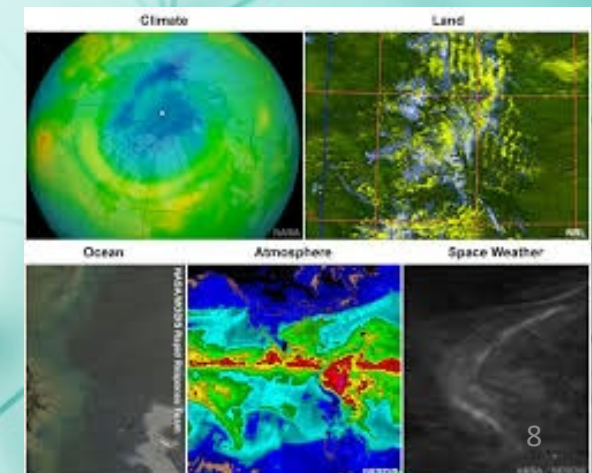
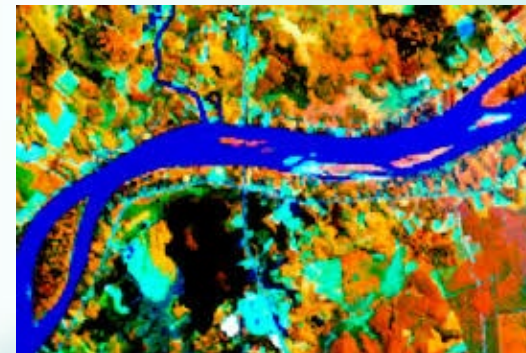
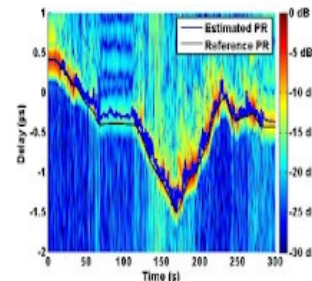
Energy Production and Distribution



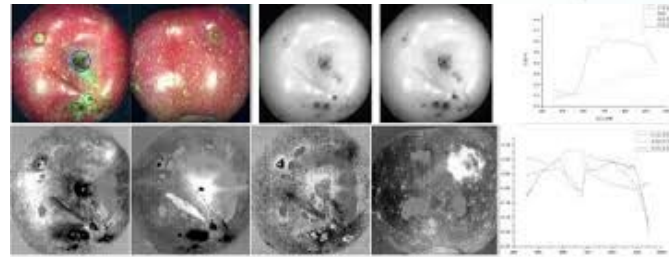
SCIENCE AND TECHNOLOGY APPLICATIONS



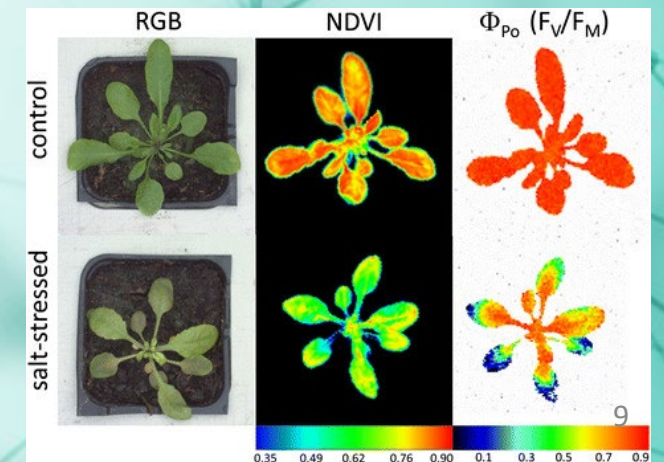
Environmental Monitoring



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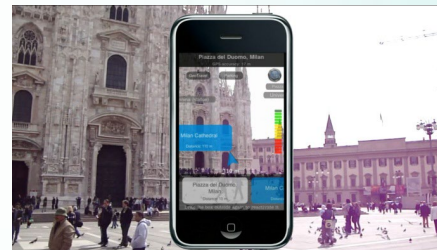
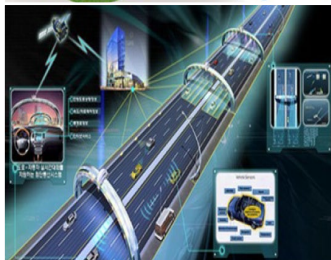
Precision Agriculture



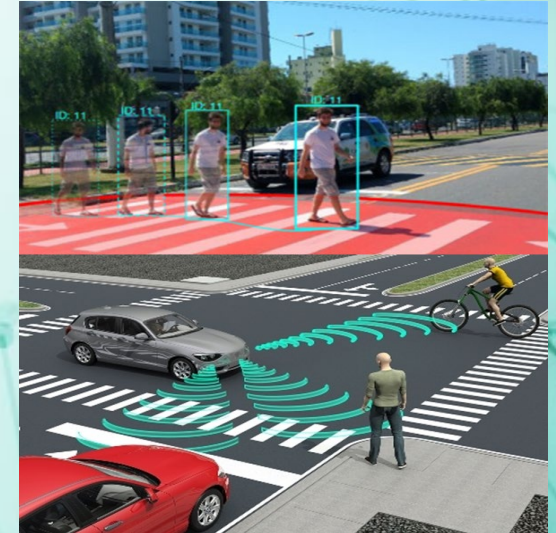
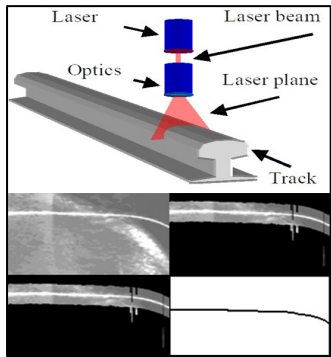
SCIENCE AND TECHNOLOGY APPLICATIONS



Consumer Electronics



SCIENCE AND TECHNOLOGY APPLICATIONS



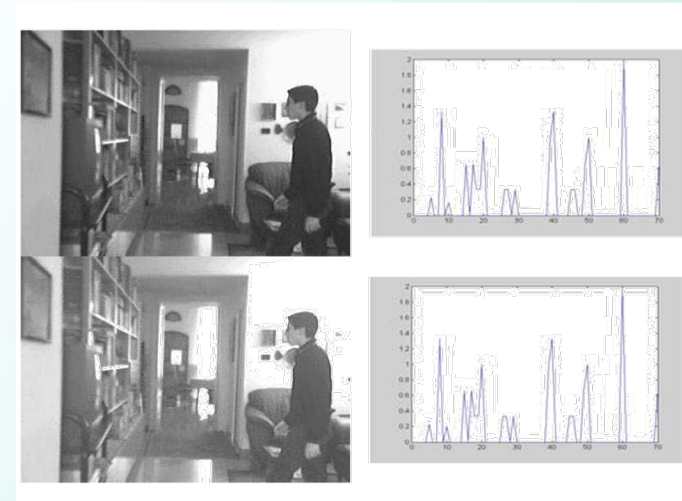
Transportation



SCIENCE AND TECHNOLOGY APPLICATIONS



Security

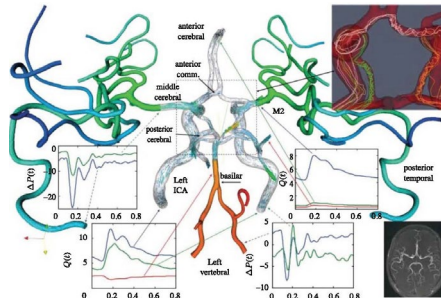
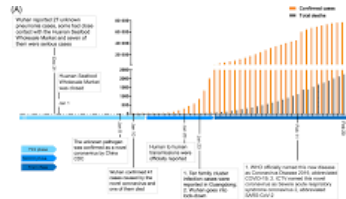
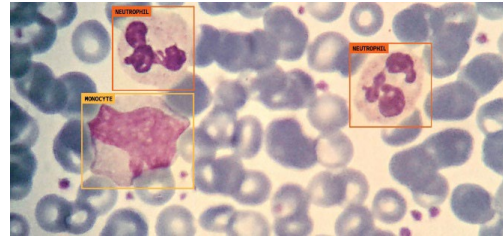
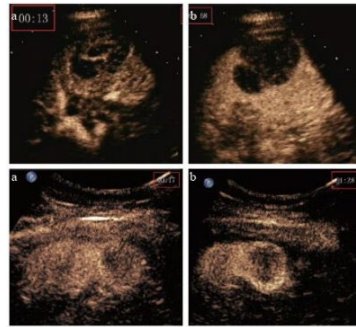
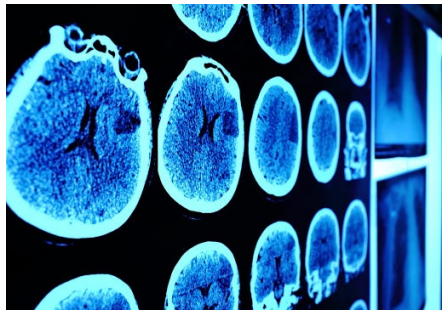


SCIENCE AND TECHNOLOGY APPLICATIONS

Smart Cities



SCIENCE AND TECHNOLOGY APPLICATIONS



Medical Applications



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EDUCATIONAL PATHS

1st YEAR

EDUCATIONAL ACTIVITIES	CFU/ECTS
Advanced Foundations of Mathematics for AI	6
Advanced Foundations of Statistics for AI	6
Advanced Foundations of Physics for AI	6
Advanced Foundations of Artificial Intelligence Modulo 1: Artificial Intelligence Modulo 2: AI for Signal and Image Processing	12
4 Courses: mandatory courses of the application area selected by the student	30

2st YEAR

EDUCATIONAL ACTIVITIES	CFU/ECTS
Data-driven organizations and management	6
Advanced Foundations of Law and regulations in privacy and data protection	6
1 Course: elective course of the application area selected by the student in the 1 st year	6
Free-choice courses: 2 Courses chosen by students	12
Further linguistic competences	3
Stage: practical activities for the MS dissertation	6
MS Dissertation and defense	21

Application Area 1: AI for Industry and Environment

MANDATORY EDUCATIONAL ACTIVITIES	CFU/ECTS
Systems for Industry 4.0 and environment (IoT)	6
Advanced data management and decision support systems	6
Advanced artificial intelligence, machine learning and deep learning	6
Sensing and vision for industry and environment Modulo 1: Intelligent sensing and remote sensing Modulo 2: Vision for industry and environment	12
ELECTIVE EDUCATIONAL ACTIVITIES: select 1 course	
Intelligent monitoring and control systems	6
Environmental monitoring and management	6
Privacy and data protection	6

Application Area 2: Intelligent Embedded Systems

MANDATORY EDUCATIONAL ACTIVITIES	CFU/ECTS
Embedded systems architectures and design	6
Advanced data management and decision support systems	6
Advanced artificial intelligence, machine learning and deep learning	6
Ambient intelligence Modulo 1: Advanced human-system interfaces (6 CFU) Modulo 2: Ambient intelligence and domotics (6 CFU)	12
ELECTIVE EDUCATIONAL ACTIVITIES: select 1 course	
Embedded systems for biomedical applications	6
Intelligent consumer technologies	6
Artificial vision	6
Privacy and data protection	6

Application Area 3: Sensing and Signal/Image Processing for Healthcare and Environment

MANDATORY EDUCATIONAL ACTIVITIES	CFU/ECTS
Advanced computational techniques for big imaging and signal data	6
Machine learning for modelling Modulo 1: Supervised learning Modulo 2: Unsupervised learning	12
Signal and imaging acquisition and modelling in healthcare	6
Signal and imaging acquisition and modelling in environment	6
ELECTIVE EDUCATIONAL ACTIVITIES: select 1 course	
Physical sensors and systems for biomedical signals	6
Physical sensors and systems for environmental signals	6
Physical sensors and systems for biomedical imaging	6
Physical sensors and systems for environmental imaging	6

Application Area 4: Complex Systems and Quantum Technologies

MANDATORY EDUCATIONAL ACTIVITIES	CFU/ECTS
AI models for physics	6
Machine learning for modelling Modulo 1: Supervised learning Modulo 2: Unsupervised learning	12
Statistical learning	6
Foundations of quantum computing	6
ELECTIVE EDUCATIONAL ACTIVITIES: select 1 course	
Advanced statistical mechanics and disordered systems	6
Quantum information and algorithms	6
Statistical mechanics of neural networks	6
Quantum simulation	6



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