POLITECNICO
MILANO 1863

School of Civil, Environmental and Land Management Engineering

School of Industrial and Information Engineering

Geoinformatics Engineering Master of Science

General presentation of the study programme

The vision of Digital Earth was proposed by Al Gore in 1998 as a multi-dimensional and multi-resolution model of the planet to contextualize the huge amount of spatial information relating to the physical and socio-economic environment. Every day humans generate quintillions (10^{30}) of bytes of data: 80% of them are spatial data. Such a massive flow generates new challenges since stored data have to be analyzed and processed. Therefore, a new scientific and technical figure who combines expertizes of Computer Science, Environmental Engineering and Geomatics is needed.

Geoinformatics Engineers are high level experts in technologies for measuring, georeferencing, managing, analyzing, visualizing and publishing spatial and time varying information, with a particular concern to environmental data.

Urban and agricultural land planning, monitoring and management, infrastructure design, transport and traffic monitoring and management, environmental modeling, geography and Earth sciences are the main application fields of Geoinformatics Engineering. All those fields attain to the general context of sustainable management of environment and land.

Geoinformatics Engineers will thus be involved in the design, implementation and operation of geodata projects to support the new paradigms of Participative Digital Earth, Smart City and Smart Society as well as a variety of decisions at regional, country and global level.

Politecnico di Milano has activated in 2016 / 2017 the first Italian Master of Science in Geoinformatics Engineering: this MSc exploits our long lasting experience in both Environmental, Geomatics and Computer science to form new

and multidisciplinary experts highly requested by both private and public sectors.
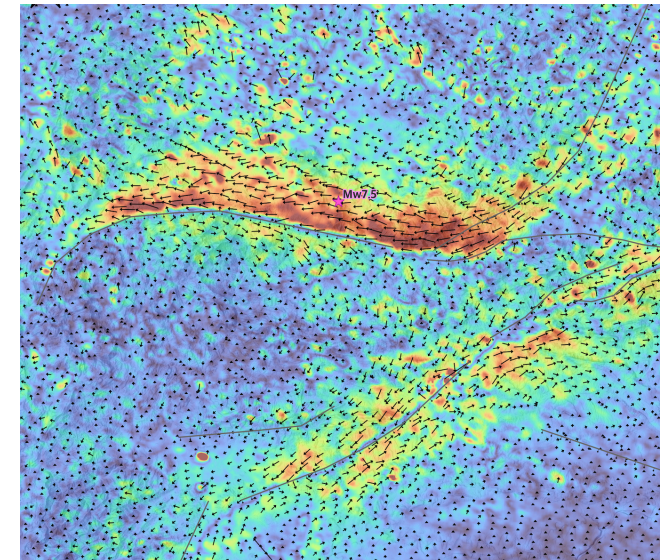
Ground velocity derived from Sentinel-1 Synthetic Aperture Radar (SAR) data (pixel offset tracking).

Study organization

The Master of Science in Geoinformatics Engineering is a two years international master course taught in English for Italian and foreign students.
Students with academic background in environmental science will find an introductory course in computer science, while those with a computer oriented first level degree will follow a course on geomatics and environmental issues.
The mandatory courses cover topics such as Geospatial data analysis, Geographical Information Systems (GIS), Positioning and location based services, Pollution measurement and management on the Geomatics / Environmental side as well as Computing Infrastructures, Computer Security, Databases, Software engineering in the Computer Science area. Eligible courses will allow students to deepen their expertise either in computer programming and computer systems design,

dealing for instance with multidimensional and mobile applications; or in geomatics and environmental issues dealing for instance with Earth observation, geophysical data processing or hydrogeological risk.

A research on an original scientific topic closes the path of the student and constitutes his MSc thesis.
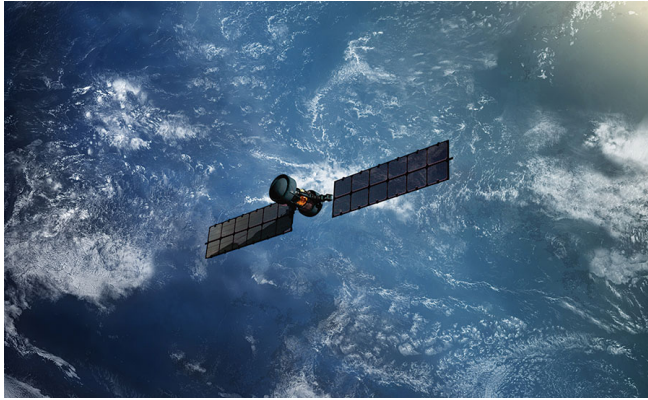
Spacecraft of the European Global Satellite-Based Navigation System (Galileo).

Careers options and profiles

Geoinformatics Engineers play an active role in the evolution of spatial information. Their expertizes can be summarized as follows.

1. Management of spatial information in the processes of acquisition and georeferencing, analysis, classification and processing, archiving, representation, publication and distribution.
2. Design and implementation of infrastructures to acquire, model and analyze spatial data and phenomena, manage, publish and share the spatial information.
3. Advanced technologies for Big Geodata and internet of Places.
4. Participation to the evolution process of Geoinformatics Engineering.

Geoinformatics Engineers find a placement in all the branches that use and develop environmental and spatial information: GIS companies,

Computer Science industry, national and local Agencies for the production of data relevant to cadaster, cartography and land management. Furthermore, nowadays spatial information is everywhere: therefore, Geoinformatics Engineers find job also in big companies or agencies that need and use spatial information.

In summary, Geoinformatics engineers find employment in:

- Small and medium-sized companies working in the field of GIS development and management, of Computer Science applied to territorial data-base management, to logistics and land planning
- Public and private, national and local companies working on territorial mapping, on cadaster, on spatial data infrastructure, on territorial data collection, on environmental data management and analysis
- Big industry (e.g., for telecommunications) and big companies which needs experts for spatial information
- Companies developing systems for the analysis and management of networks of environmental sensors
- Companies developing hardware and software for environmental applications
- Advanced research institutes or companies working on the Internet of Places, Big GEOdata, Sensor Enablement, Urban Data City Analytics, Earth Observations.

These are clearly critical sectors for the scientific, technological and social development, both at the national and global scale.

Admission Requirements

Students with a Bachelor degree in Computer Science or Environmental / Geodetic / Geomatics Engineering/ Civil Engineering / Mathematical Engineering are eligible for application. Students with a different background (for example other Engineering programmes, Geography, Land

planning, Natural Sciences, and Physics) will be taken into consideration individually.
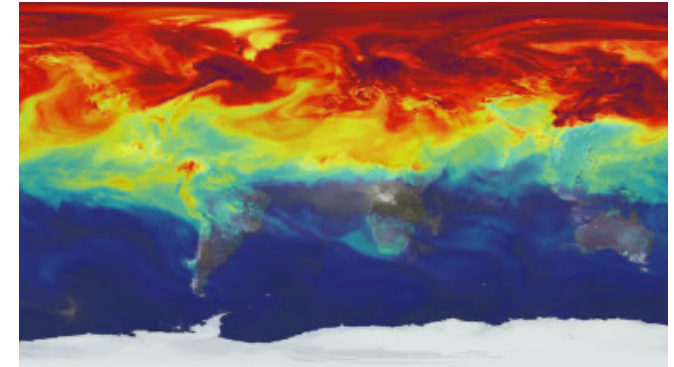
Simulation of carbon dioxide movement in the atmosphere (National Aeronautics and Space Administration, NASA).

Tuition fees

For EU students fees are based on students' family income and on the presented study plan. They range from about €900 to €3,900 per year. For Non-EU students fees are equal to about €3,900 per year.

Contacts

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