



# Research

Study for a PhD





## Graduate programme

Junior researchers studying for a PhD degree at the International Institute for Geo-Information Science and Earth Observation (ITC) are registered in its graduate programme. Each graduate student carries out a PhD project embedded in one of the themes of the research programme under the supervision of the theme leader. Some research projects are defined by the research theme leader and for these projects graduate students are recruited to carry out the research. Research theme leaders also encourage applicants to prepare and submit a research project outline addressing a problem with which the applicant is already familiar, as part of the application and registration procedure.

There are around 100 graduate students at ITC. Most are full-time PhD student researchers aiming to submit and defend a PhD thesis at one of the Dutch universities to which ITC is affiliated through adjunct appointments of its professors (University of Twente, Utrecht University, Wageningen University and Research Centre, Delft University of Technology). Others are PhD interns spending periods of about one year at ITC as part of their studies to submit and defend a PhD thesis at a university overseas. For full-time PhD student researchers the time trajectory for completing a PhD research project is 3½ years (including the option for a sandwich period overseas). Each PhD research project is subject to quality assurance checks. The first six months of the PhD research project form a probationary period, and during this time the PhD student has to develop his/her research proposal for public presentation and examination. Successful completion of the qualifier is mandatory for continuation of the PhD research. Subsequent quality assurance checks are made annually. Since 1990, over 150 alumni of the graduate programme have been awarded a PhD degree by a Dutch university.

If you would like to study within the graduate programme, consult the Institute's research web pages at [www.itc.nl/research](http://www.itc.nl/research), and browse the research themes to find a theme appropriate to your background and research interests. The next step is to carry out a self-assessment of your eligibility for registration (see box). At the end of the self-assessment you will find a link to online application for registration in the graduate programme. When submitted, the on-line application will be forwarded to the leader of the research theme you have selected.

## Pre-application self-assessment for the graduate programme

Do you have a valid passport?

Have you successfully completed all of the following:

- five years of tertiary (post-school) education?
- an MSc degree or equivalent?
- an MSc (or equivalent) thesis or dissertation based on approximately six months of independent research?

Do your competencies include all of the following:

- basics of geo-information science (GIS) and earth observation (remote sensing)?
- background and research interest / idea that fits in with the ITC research programme?

Can you demonstrate your proficiency in English by means of one of the following:

- an MSc thesis in English?
- a recent TOEFL certificate with a score of at least 600?
- a recent IELTS certificate with a score of at least 6.0?

Is the status of your study funding one of the following:

- fellowship assured by a fellowship provider?
- application to fellowship provider submitted or planned?
- partial support for study in a sandwich construction assured through local partner(s)?
- other means of funding?

You must have answered "Yes" to all five questions in order to proceed with an application for registration in the ITC graduate programme.

Please note that ITC does not offer fellowships or similar funding for graduate students (except for advertised vacancies for which ITC has already secured funding). However, if your intended graduate studies are substantially funded by a fellowship provider or by a partner in a sandwich construction, you will be considered for co-funding from the ITC research fund.



## Food security and environmental sustainability

Food security is a key individual right, but still far from being a reality in many parts of the tropics (Millennium Development Goal 1). Trade and food-aid has widened the gap between net importers and net exporters of agricultural commodities and has reduced the need for countries to be self-sufficient.

As populations - in particular urban populations - increase, the land area dedicated to agricultural production increases worldwide, mainly in Africa and Latin America. This is at the expense of the environment, thus putting MDG 7 (Environmental Sustainability) in jeopardy. In fact, MDG 7 may be incompatible with MDG 1.

### Research programme

The research programme of the International Institute for Geo-Information Science and Earth Observation (ITC) develops cutting-edge knowledge and innovative approaches in geo-information science and earth observation. The programme addresses applications of geospatial data for space and resource management and the provision of geospatial data for the user community, with emphasis on solving problems in developing countries.

In order to ensure that new knowledge and innovation in space and resource management and in the provision of geospatial data lead to societal benefits, the programme is formulated as a number of interlinked research themes. Each theme encompasses profound knowledge in three domains:

- earth observation and geoinformation processing technologies relevant to the thematic field;
- the geospatial processes playing a role in the thematic field; and
- the way in which the community associated with the thematic field can access and exploit new knowledge and innovation.

In each theme, research is carried out by a group led by one of ITC's professors. Each group typically comprises several expert staff members and a number of graduate students carrying out

research for a PhD degree within the framework of the graduate programme. MSc students are also assigned to a research theme as apprentice researchers during their thesis period (six months). Furthermore, the outcome of research activities is used to update the education in both degree, diploma and certificate (short) courses (visit [www.itc.nl/education](http://www.itc.nl/education) for further information or see the separate education brochure).

### Fifteen research themes

- Biodiversity in fragmenting landscapes (Prof. A.K. Skidmore)
- Carbon cycle and climate change (Prof. A. de Gier)
- Disaster management (Prof. V. Jetten)
- Earth systems science (Prof. F.D. van der Meer)
- Food security and environmental sustainability (Prof. E. Smaling)
- Governance and integrated spatial assessment (Prof. A. van der Veen)
- Informed multilevel governance of urban regions (Prof. Y. Georgiadou)
- Land administration for informed governance (Prof. P. van der Molen, Prof. J. Zevenbergen)
- Managing water scarcity (Dr. M. Lubczynski)
- Spatial data infrastructure technology (Dr. R. de By)
- Spatio-temporal data integration and visualization (Prof. M.J. Kraak)
- Stochastic methods for image mining and data quality (Prof. A. Stein)
- Sustainable urban-regional dynamics (Prof. M. van Maarseveen)
- Utilisation of sensor developments for efficient topographic mapping (Prof. G. Vosselman)
- Water cycle and climate (Prof. B. Su, Prof. W. Verhoef)

### Research partnerships

ITC's research programme is carried out in collaboration with a range of worldwide partners, that have a complementary expertise base. Current partnerships can be viewed at: [www.itc.nl/research/researchpartners.asp](http://www.itc.nl/research/researchpartners.asp)



### What's ITC all about?

One of humankind's greatest challenges is to achieve an appropriate balance between developing natural resources and maintaining an optimal natural environment. To meet this challenge, we need detailed and reliable geo-information and geo-information management tools.

The key words characterising our activities are *geo-information management*, *worldwide* and *innovative*. We concentrate on earth observation, the generation of spatial information, and the development of data integration methods. Furthermore, we provide tools that can support the processes of planning and decision making for sustainable development and the alleviation of poverty in developing countries and emerging economies.

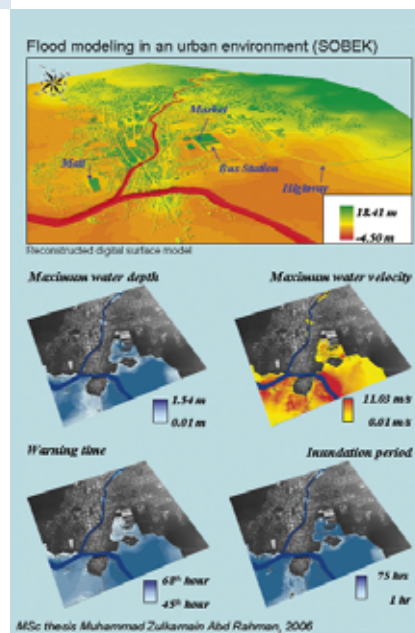
### Disaster management

Every year natural disasters have severe consequences for a large part of the earth's population, ecosystems and resources, particularly in developing countries. Although disasters are mostly a result of natural processes, their frequency and magnitude seem to be increasing as a result of changing driving forces such as climate change, land use changes and population dynamics. The disaster management research focuses on the consequences of "geo-hazards", both those that cause rapid disasters which have a shock effect and those that cause slow-onset disasters which result in a strain or negative trend in our environment. Geological hazards such as earthquakes, tsunamis, volcanic eruptions, landslides, and hydro-meteorological hazards (flooding, mudflows, cyclones) can be seen as causing rapid disasters, whereas land degradation, desertification, soil erosion and soil degradation can be seen as causing slow disasters.

### Role of research at ITC

As a centre of excellence in the forefront of knowledge discovery, the Institute carries out research within the framework of a coherent research programme that addresses specific problem fields in geo-information science and earth observation. This yields new tools and methods for the collection, storage and processing of geospatial data and pioneers new applications of geospatial data to societal problems, particularly in developing countries, in which geo-information science and earth observation play an important role. The research programme also contributes to ITC's capacity building mission in developing countries and emerging economies by training junior researchers from institutes and organisations in these countries.

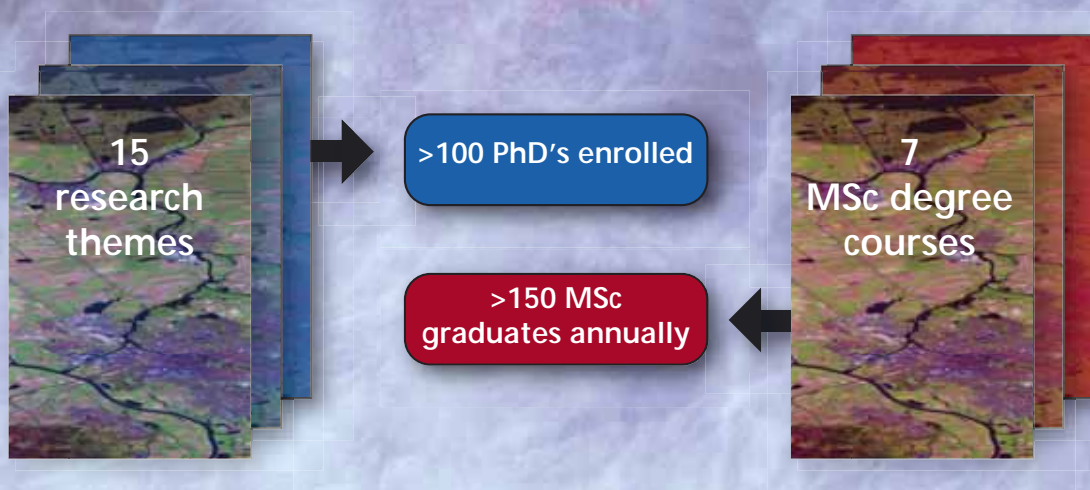
At the International Institute for Geo-Information Science and Earth Observation (ITC), Enschede, the Netherlands, knowledge of geo-information management is readily available and is continually being developed and extended. By means of education, research and project services, we contribute to capacity building in developing countries and emerging economies. In doing so, considerable attention is paid to the development and application of geographical information systems (GIS) for solving problems. Such problems can range from determining the risks of landslides, mapping forest fires, planning urban infrastructure, implementing land administration systems, and monitoring food and water security, to designing a good wildlife management system or detecting environmental pollution.





For more information on our  
research and graduate programme  
Geo-information Science and Earth Observation  
[www.itc.nl/research](http://www.itc.nl/research)

### ITC graduate programme Geo-information Science and Earth Observation



#### Output

- PhD and MSc graduates
- Scientific publications

#### Partnerships

- Research partnerships
- Joint education programme

#### Affiliations

- University of Twente
- Wageningen University and Research Centre
- Utrecht University
- Delft University of Technology

#### Association

- United Nations University-ITC
  - School for Disaster Geo-information Management
  - School for Land Administration Studies



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**Information on ITC's research and graduate programme**

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More detailed information about ITC's research and graduate programmes can be found on our web pages at [www.itc.nl/research](http://www.itc.nl/research)



**ITC** INTERNATIONAL INSTITUTE FOR GEO-INFORMATION SCIENCE AND EARTH OBSERVATION