PhD Position in Geography:
Assessing the changes in land-use, population and social vulnerability in low elevation coastal zones (LECZ)

The PhD project focuses on the nexus of changes in sea-level as a result of global warming, and the worldwide patterns in population redistribution that have brought along rapid population and urban growth taking place in coastal areas.

The global forecasts of mean sea level rise by as much as 1 m by 2100 according to IPCC. Many studies have estimated the potential risks of sea level rise at local and global levels, but were mostly focussed on estimating population size that is affected by sea level rise. Less studies have analysed the land development and land reclamation in the coastal areas and the vulnerability of different socio-demographic groups in these areas. In this study, a novel approach will be developed and tested, that uses Google Street View images for training machine learning models to identify socio-demographic characteristics and status from the remote sensing images. It is challenging to estimate the socio-demographic groups living in the coastal areas because of the lack of data from traditional sources such as censuses.

The specific aims for this study are 1) to assess the land use changes in coastal areas globally by focussing on built up areas from 2000 to 2020 by using remote sensing image processing; 2) to estimate how much new land has been reclaimed from the sea from 2000 to 2020; and 3) to evaluate which socio-economic groups are growing in the coastal zone and estimate their vulnerability to sea level rise both globally and in focussed case study areas.

The research is part of the “Impact of climate warming and land use dynamics on greenhouse gas fluxes in wetlands from local to global scale” and “Understanding the Vicious Circles of Segregation. A Geographic Perspective” research projects and is being done in cooperation between the Landscape Geoinformatics Lab and Centre for Migration and Urban Studies in the Department of Geography, University of Tartu.

Core tasks include (1) conducting a systematic literature review on the state of the art of research in the field (2) the classification of remote sensing images of coastal areas using Landsat analysis ready data (3) identifying low coastal zones from global elevation models, (4) performing Google Street View image analysis for detecting socio-economic groups and train ML model to identify those groups from remote sensing images; (5) performing statistical analysis and estimating what socio-economic groups are most exposed to sea-level rise.

Requirements

Master’s degree in geo-information or wider technical and natural sciences (GIS, geoinformatics, GI Science, remote sensing, Earth Observation, computer sciences, physics) and wider interest about contemporary human-environmental relations.

The ideal candidate has proven experience in following essential skills:

- optical remote sensing and image classification, preferably with the ESA SNAP toolbox
- spatial analysis and GIS, comfortable with QGIS or ArcGIS
- scripting of workflows and data analysis with Python or R
- confident in English language spoken and written. See more info about language requirements https://www.ut.ee/en/english-language-requirements-phd-students

In addition, following skills would be beneficial:
Priority will be given to candidates with experience in the processing of satellite images, machine learning, spatial data analysis, programming knowledge, especially in Python, as well as knowledge of processing a big data. For shortlisted candidates, we will also aim to assess wider understanding of human-environmental process as related to the PhD project, technical and spoken communication skills in an online interview.

**Funding and Health Insurance**

Full-time PhD students receive a doctoral allowance of 660 euros per month plus an additional performance stipend of 400 euros per month – in total 1060 EUR per month tax-free payments. Living costs in Estonia are very reasonable and the allowance can cover your living costs.

All PhD students who receive a doctoral allowance are provided with Estonian national health insurance. Doctoral allowance can be paid out as soon as a temporary residence permit (non-EU students) or temporary right of residence (EU students) has been obtained. Health insurance coverage is available for the full nominal study period of PhD studies (4 years).

**Department of Geography at University of Tartu**

The University of Tartu (UT) is Estonia’s leading centre of research and training. The University of Tartu belongs to the top 1.2% of world's best universities. UT accounts for more than a half of all the doctoral degrees conferred, research publications, and national R&D financing in Estonia.

The Department of Geography (https://www.geograafia.ut.ee/en), headed by Dr. Evelyn Uuemaa, is a multidisciplinary research unit that is conducting cutting edge research in the fields of human mobility and landscape ecology. It is a young, dynamic and international organization where English is the second language. PhD studies take place mainly in English, and the Department hosts a strong international master programme “Geoinformatics for Urbanized Societies”.

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**Documents to Be Submitted**

The following electronic documents must be submitted via DreamApply by the application deadline:
1. application;
2. official copy of the diploma and diploma supplement (transcript/mark sheet) of the preceding study levels (both bachelor's and master's) in the original language;
3. official translation of the diplomas and diploma supplements into English;
4. proof of English language proficiency at a satisfactory level;
5. copy of the passport page stating the applicant’s personal particulars;
6. doctoral thesis project;
7. curriculum vitae (relevant form CV).

See more details here: https://www.ut.ee/en/admission-geography-phd-programme

In addition, it is recommended to submit a motivation letter (no more than 1 page, in English). In the motivation letter briefly state why you are interested in this PhD position, how we could foster your professional development and career trajectory, and in which ways your interests fit the research strengths of our team and project.

For shortlisted candidates, we may request for an online interview.

The deadline for applications is 1st of June 2020

Apply here: https://www.ut.ee/en/phd-geography

More information: Dr. Evelyn Uuemaa (evelyn.uuemaa@ut.ee)