

## PhD Thesis Position

### at Institute of Photogrammetry and Remote Sensing

Institute of Photogrammetry and Remote Sensing, Department of Civil Engineering, Geo and Environmental Sciences



#### Who we are:

Our team at the Institute of **Photogrammetry and Remote Sensing (IPF)** researches and teaches in the geo-, environmental and image sciences. The scientific focus lies in particular on the development of methods for automatic survey, analysis and visualisation of spatial data about natural, anthropogenic to industrial processes and their objects with geodetic accuracy. We are devoted to foundational research on connecting physical processes with machine learning and stochastic retrieval methods, as well as applied research projects in remote sensing or industrial image processing and computer vision. Thanks to our expert and highly committed staff, who work together interdisciplinarily in flat hierarchies, our research attains nationally as well as internationally high recognition and visibility.

#### PhD Topic: $p$ -Adic Numerical Analysis of Processes on Graphs

This PhD topic is a part of the DFG project *Distributed Simulation of Processes in Buildings and City Models* BR 3513/14-1 and BR 2128/21-1. In this joint project of IPF with the Geodetic Institute, processes in buildings, infrastructure and city models are to be simulated using their topological data structures across various levels of detail on distributed processors. While the topology can be described with relations and graphs, the  $p$ -adic numbers are predestined for their use in distributed computing due to their inherent hierarchical nature. The named processes on graphs can be described with  $p$ -adic pseudodifferential equations defined by  $p$ -adic integral operators on  $L^2$  spaces of complex-valued functions defined over the field of  $p$ -adic numbers. The aim of this PhD dissertation is to study such  $p$ -adic pseudodifferential equations on graph analytically and to solve them numerically.

#### Are you interested? Do you want to write your PhD thesis with us?

We offer you the possibility to work in a professionally excellent and decidedly cooperative team! As a committed young academic you will work in the named research project and thus build the foundation for your PhD thesis. As one of the few institutes at KIT, we can supervise you on your path to Dr.-Ing. as well as Dr. rer. nat. Further, you will obtain access to further education at the manifold offers of the graduate school **GRACE** (Graduate School for Climate and Environment).

## What is it precisely about?

In the case of a successful application, you will obtain the possibility to work on this research project on a 50% position TV-L 13 for a limited term of 3 years. We are planning with a time of 3 years for the successful conclusion of your PhD dissertation, and guarantee funding for this period.

## What do you need to bring with you?

If you feel linked with a team-oriented work ethos, have basic knowledge about  $p$ -adic numbers and graphs, are interested in analytic and numerical questions in  $p$ -adic analysis, and are curious about the engineering context of the research project, then you are the right person for us. Helpful are also programming skills (e.g. python or Java).

## And now?

**Apply for this position!** Contact us until December 15, 2021. We are at your disposition also for further information!

### Contact:

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