Research Assistant - PhD Student

in Computer Science, Visualization, Data Science

Job Summary

Open position for a PhD student in the project *Uncertainty Visualization and Analysis of High-Resolution Numeric Weather Forecasts* at the University of Zürich. This position is for a PhD student participating in a SNF (Swiss National Science Foundation) funded joint project between the University of Zürich (UZH) and the University of Buenos Aires (UBA).

Description

The open position is for a research assistantship in a PhD program in computer science with a focus on interactive data visualization and visual analytics of weather prediction simulations to improve short range warning systems of high impact weather events. This project is specifically targeted at the interactive analysis and visualization of numerical high-resolution weather forecast models, covering aspects such as spatio-temporal uncertainty visualization, visual abstractions and uncertainty representations, ensemble visualization, as well as visual analysis of storm tracking and sensitivity of large dimensional systems. A central focus is on the uncertainty and sensitivity analysis in space and time, as well as interactive visual analytics techniques.

The project requires strong interest not only in visualization or 3D graphics, algorithms and data structures, but also in data analytics as well as numerical data processing and analysis methods. Furthermore, good software programming skills are required as well as a strong willingness and ability to learn about numerical weather prediction models. Good C/C++ and Python skills are needed.

The activities of the position not only include research and continuing education for PhD students, but also support in teaching as well as administrative tasks. The main goal is to conduct excellent research generating results which are published and presented in top international journals and conferences, and to eventually work towards achieving a PhD degree through the writing and defense of a doctoral dissertation.

Project Partners

The lead of the project is at the University of Zurich (UZH), a top internationally recognized research university with faculties in medicine, humanities, economics as well as mathematical and natural sciences. UZH is the largest university in Switzerland and regularly ranked among the top world leading research universities. The Department of Informatics (computer science) covers major computer science, software engineering and information management research and teaching topics, it offers BSc, MSc as well as PhD degrees in informatics/computer science. The researchers of the Visualization and MultiMedia Lab (VMML) research group, leading this project at UZH, have an established track record in scientific visualization research.

The project partner is the Atmospheric and Oceanographic Research Center (CIMA for its acronym in Spanish http://www.cima.fcen.uba.ar/) at the University of Buenos Aires (UBA). CIMA is very well recognized for its contributions to understanding climate variability and climate change in South America as well as for contributing to the improvement of numerical weather capabilities in the region. CIMA is located at the School of Exact and Natural Sciences of UBA providing the opportunity to interact with different disciplines including math, physics, computer science and earth sciences. CIMA and the researchers involved in this project have strong collaboration links with researchers in different countries in South America, North America, Europe and Asia.

Workplace

For this PhD position, the workplace is in the VMML research group in the Department of Informatics at UZH, located in the vibrant city of Zürich as part of the University of Zürich's Nord-Campus in Oerlikon. The Nord-Campus is conveniently located a short walk off the Max-Bill Platz, center of the new trendy living, shopping and business district in Oerlikon, as well as near the Oerlikon train, S-Bahn and tram stations. Also the Zürich international airport (ZRH) is reachable within minutes with public or private transportation.

As part of this project, regular interactions with our partners from CIMA at UBA are foreseen, including some research exchange visits.

Requirements

A MSc degree in computer science or closely related area from a top research university is required to enter our PhD program. A prior focus on or experience with interactive data visualization or computer graphics, as well as good numerical math skills and excellent programming skills are also required.

The prospective candidates are supposed to have an excellent background in computer science as well as good mathematical skills and previous experience in interactive visualization and 3D graphics. Strong interests in data analysis, numerical methods and collaboration with other researchers and domain scientists is of further importance. Furthermore, the ability to work with and integrate diverse programming frameworks is of great benefit.

Very good English skills both in speaking and writing are required, as well as the capability to work independently and in a team, as well as in an interdisciplinary and international context.

What we offer

The *Uncertainty Visualization and Analysis of High-Resolution Numeric Weather Forecasts* project is an interdisciplinary project aiming to improve our capability of anticipating high impact weather events (such as flash floods, large hail, etc) by developing advanced techniques for the quantification and visualization of high-resolution numerical weather prediction systems and their associated uncertainty. We offer the opportunity to work in an international and interdisciplinary environment. The project PIs are Prof. Dr. Renato Pajarola (http://www.ifi.uzh.ch/vmml.html), Prof. Dr. Paola Salio (https://www.researchgate.net/profile/Paola-Salio), Prof. Dr. Juan Ruiz (https://www.researchgate.net/profile/Juan-Ruiz-13), and Dr. Alexandra Diehl as main project partner. More information about the project will be available at https://unweather.ifi.uzh.ch/.

Benefits at UZH

Research assistants, PhD students of UZH are remunerated according to university regulations and standards from the funding agencies (SNF). Appointments will be made with respects to standard university rules, same applies for fringe benefits and vacation days. Appointments are expected to involve a full-time effort in doctoral research, graduate education, teaching and community service.

It is the goal of UZH to offer an equal opportunity workplace environment and as part of this we strongly encourage women to apply. Specific benefits include flexible working hours, young scientist promotion opportunities, parental leave benefits, nursery services and care for dependents and much more.

Application

Applications must include a detailed CV/resume, information of university level educational background, brief description of practical work and research experience in computer science, clear exposition of prior visualization or graphics experience, as well as a short statement of motivation and goals.

Certified copies of transcripts, degrees and reference letters may eventually be required for admission to the PhD program.

For applications and further information about this position at UZH, please send an email using the terms "**SPIRIT Application**" in the subject to Prof. Renato Pajarola:

pajarola@ifi.uzh.ch

Dates and More

- The first deadline for applications is Friday, August 19, 2022.
- Entrance is estimated for October 2022 but subject to the successful evaluation of candidates at both project partners UZH and UBA
- Duration is expected to be about 4 to 5 years for PhD students

Contact

Prof. Dr. Renato Pajarola
Visualization and MultiMedia Lab
Department of Informatics, University of Zürich
Binzmühlestrasse 14
8050 Zürich
URL: http://vmml.ifi.uzh.ch/
Email: pajarola@ifi.uzh.ch