



## Open Ph.D. Position in the Research Group Photogrammetry

(scroll down for [English version](#) of the job description and for the [project summary](#))

Am Department für Geodäsie und Geoinformation ([www.geo.tuwien.ac.at](http://www.geo.tuwien.ac.at)), Forschungsgruppe Photogrammetrie, ist eine Stelle für eine/n Assistenten/in (30 Wochenstunden), voraussichtlich ab 1. Oktober 2013 für die Dauer von 3 Jahren zu besetzen. Das monatliche Mindestentgelt für diese Verwendung beträgt derzeit € 1955,80 brutto (14x jährlich). Die Anstellung erfolgt im Rahmen des FWF-Projektes P25883 „Smart-Geology for the World’s largest fossil oyster reef“ unter der Leitung von Doz. Dr. Mathias Harzhauser (Naturhistorisches Museum Wien).

**Aufnahmebedingungen:** abgeschlossenes Masterstudium der Studienrichtung Geodäsie und Geoinformation mit einem Schwerpunkt in Photogrammetrie oder ein vergleichbares Studium (angewandte Mathematik, Informatik, Computer Vision), Interesse an Forschung und interdisziplinärer Zusammenarbeit. Sonstige erwünschte Kenntnisse: terrestrisches Laserscanning, Prozessierung von Geodaten, Umsetzung von Methoden in Software. Grundkenntnisse in Geologie, Sedimentologie und/oder Paläontologie sind willkommen aber keine Bedingung.

**Bewerbungsfrist:** bis 10. September 2013

Bewerbungen erfolgen per E-Mail ([contact@geo.tuwien.ac.at](mailto:contact@geo.tuwien.ac.at)) an die Forschungsgruppe Photogrammetrie, Department für Geodäsie und Geoinformation, Technischen Universität Wien, Karlsplatz 13, 1040 Wien. Die Bewerber und Bewerberinnen haben keinen Anspruch auf Abgeltung angefallener Reise- und Aufenthaltskosten, die aus Anlass des Aufnahmeverfahrens entstanden sind.

**English version:** At the Department of Geodesy and Geoinformation ([www.geo.tuwien.ac.at](http://www.geo.tuwien.ac.at)) of Vienna University of Technology a position in the research group photogrammetry is offered.

One position for a research assistant (30 hours per week) in the research group photogrammetry, expected start October 1<sup>st</sup>, 2013 for a duration of 3 years. The salary for this position is currently € 1.955,80 monthly pre-tax (14 times per year). The position is offered within the FWF project P25883 „Smart-Geology for the World’s largest fossil oyster reef“ under the guidance of Dr. Mathias Harzhauser (Naturhistorisches Museum Wien).

**Requirements:** master degree in Geodesy and Geoinformation with focus on Photogrammetry or a comparable field of study (applied mathematics, computer-sciences, visual computing); interests in interdisciplinary research. Further expected skills are terrestrial laser scanning and geodata processing. Basics in Geology, Sedimentology and/or Paleontology would be welcome.

**Deadline for applications:** September 10<sup>th</sup>, 2013 (see address above). No costs will be reimbursed that may occur during the application procedure.

**Project summary:** The application of modern data processing and visualization technologies in geology and palaeontology is still in its infancy. Within the proposed project we will open a new field we call “Smart Geology”, which is characterized by automation and large volumes of data. This will be performed in a key-study focussing on the world’s largest fossil oyster biostrome, which is the highlight of the geo-edutainment park “Fossilienwelt Weinviertel” at Stetten in Lower Austria. The dimension of the protected site and the enormous number of individual shells (c. 15.000) makes a classical paleontological survey of its internal architecture and orientation very difficult, time consuming and highly subjective. Therefore, despite the impressive amount of publications that deal with the flora and fauna of this Early Miocene estuary in which the oyster biostrome was formed, a comparable analysis of the spectacular shell accumulation is still missing so far. No quantification of the shells was performed and the taxonomic inventory and taphonomic features were only cursorily documented during excavation.

In this project, we will investigate, if the appropriate application of state-of-the-art 3D digitizing, data processing, and visualization technologies allows for a significant automation in paleontological analyses, making an evaluation of huge areas economically feasible in both, time and costs. The major topics to be dealt with are evaluating available laser scanning and image acquisition systems for optimized 3D digitizing, increasing automation and objectivity in geological and paleontological data analysis and interpretation, and investigating the applicability of smart devices (esp. TabletPCs) to support the on-site accessibility and evaluation of paleontologically relevant data. For the evaluation of the proposed methods, we formulate two scientific hypotheses postulating that the shell-bed was formed by a tsunami or a major storm and that pre- and post-event processes can be reconstructed. To ensure reliable reference data for evaluating the proposed “Smart Geology approach”, a complete interactive survey of the whole site will be performed, which allows for a cross-validation of the results. This validation will comprise three steps namely 1. evaluating the reliability and especially the completeness and correctness of the automated processing, 2. evaluating the reliability of the conventional, operator driven data processing especially with respect to local variations in these results, possibly caused by variations in the behaviour of the operator and by variations in the quality of the input data and 3. evaluating variations of the automated results caused by variations in the given data.

By this, this project mediates between the two scientific disciplines Photogrammetry and Geology.