

## Civil and geotechnical engineer

PhD, EPFL (Switzerland)

MSc Eng., PK (Poland)



**Place of birth**

Cracow, Poland

**Nationality**

Polish

**Contact**

c/o GeoMod ingénieurs conseils SA

Av. des Jordils 5

1006 Lausanne, Switzerland

T: +41 21 311 34 30

F: +41 21 311 34 29

M: +41 764 49 73 28

E-mail: robrzud@geomod.ch

## EDUCATION

2006-2009

**Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland**

Doctoral school, programme: Mechanics

*PhD research:* Numerical modeling and neural networks to identify constitutive parameters from *in situ* tests.

*Main research activities:* finite element modeling of soil field tests; generating pseudo-experimental databases from numerical simulations of pressuremeter and piezocone tests; application of neural networks and optimization techniques to parameter identification based on experimental results from field tests.

*Thesis supervisors:* **Prof. Laurent Vulliet**

BG Consulting Engineers (Switzerland),  
Soil Mechanics Laboratory, EPFL

**Prof. Andrzej Truty**

Zace Services Ltd., Z\_Soil, (Lausanne, Switzerland),  
Institute of Geotechnics, Politechnika Krakowska (Cracow, Poland)

1996-2001

**Cracow University of Technology (PK), Cracow, Poland**

MSc in Civil Engineering; Specialization: Building and Engineering Constructions

## PROFESSIONAL ACTIVITIES

2009 -

**Geotechnical consultant engineer** *GeoMod Ing.Cons. SA & BG Ing.Cons. SA, Lausanne, Switzerland*

2003-2005

**Geotechnical engineer**

*Cracow University of Technology (PK), Cracow, Poland*

Geotechnical investigations: *in situ* soil testing, subsoil profiling and soil parameter determination; numerical modeling; geotechnical reports.

2002-2005

**Project assistant**

*Cracow University of Science and Technology (AGH), Cracow, Poland*

Collaborated the Institute of Underground Mining: Numerical analyses of access tunnels in Polish coal.

2001-2005

**Civil engineer**

*AB – Projekt, Cracow, Poland*

Designed buildings and engineering constructions in concrete: verified static determination and structural element profiles; calculated and designed shallow foundations and piles; designed technical drawings of structural element profiles for public use multi-storey buildings.

Jul.-Aug. 2001

**Engineer assistant**

*Biuro Konstrukcyjne (Grabacki&Szefer), Cracow, Poland*

Civil engineer's internship.

## UNIVERSITY ACTIVITIES

Since 2005

**Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland**

*Research/teaching assistant*

Soil Mechanics Laboratory

Delivered lectures: Neural networks in geomechanics, Master of Advanced Studies on Tunneling, 2007 and 2008 (*in English*)

Teaching assistant: Soil Mechanics, BS, 2008 (*in French*)

2001-2005

**Cracow University of Technology (PK), Cracow, Poland**

*Research/teaching assistant*

Institute of Geotechnics,

Teaching assistant: Soil Mechanics, MS; Foundations and Footing, MS, 2001-2005

## SELECTED PUBLICATIONS

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**Numerical modeling and neural networks to identify model parameters from piezocone tests: I. FEM analysis of penetration in two-phase continuum.** Obrzud RF, Truty A, Vulliet L. *Int J Numerical Analytical Methods in Geomechanics*, 2010, (published online DOI: 10.1002/nag.972)

**The Hardening Soil model – a practical guidebook.** Technical report Z\_Soil.PC 100701, Zace Services Ltd, Lausanne, August 2010.

**Numerical modeling and neural networks to identify constitutive parameters from insitu tests.** Obrzud RF, *Phd Thesis*, EPFL, Lausanne, July 2009.

**A combined neural network/gradient-based approach for the identification of constitutive model parameters using self-boring pressuremeter tests,** Obrzud RF, Vulliet L, Truty A, *Int J Numerical Analytical Methods in Geomechanics*, 2009, 33(6): 817-849.

**Optimization framework for calibration of constitutive models enhanced by neural networks,** Obrzud RF, Vulliet L, Truty A, *Int J Numerical Analytical Methods in Geomechanics*, 2009, 33(1): 71-94.

**Soils stiffness in small strains,** Truty A, Konior T, Obrzud RF, XVII Scientific Conference on Computer Methods in Design and Analysis of Engineering Constructions, Korbiewów, Poland, 2005.

## SCIENTIFIC AND ENGINEERING SOFTWARE

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Developed framework for calibration of soil models using advanced neural network/gradient minimization method based on laboratory and *in situ* test measurements (*Matlab-based application combined with finite element solvers: ABAQUS and Z\_Soil*).

## COMPUTER SKILLS

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**Numerical methods** Computational continuum and structural mechanics, hydro-mechanical system computations, finite elements, optimisation, neural networks, statistics

**FE packages** *ABAQUS, Z\_Soil*

**CAD packages** *AutoCAD*

**Mathematics** *Matlab, Mathcad, Mathematica*

**Others** Engineering Packages (e.g. *GEO-SLOPE, RIDO*), Object-oriented programming in *Matlab, C++* (basics), *Latex, Microsoft Office, Adobe applications*

## LANGUAGES

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**Polish** (native), **English** and **French** (advanced), **German** and **Russian** (basic knowledge)

## WORKSHOPS & TRAININGS

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May 2007 **Nonlinear finite element analysis** taught by T.J.R. Hughes & T. Belytschko *Berlin, Germany*

August 2006 **Soil mechanics, rock mechanics and underground structures analysis on microcomputers using plasticity theory** taught by A. Truty, K. Podles, Th. Zimmermann *Lausanne, Switzerland*

May 2004 **Interpretation of in situ tests and sample disturbance of clays** *Baranowo near Poznan, Poland*  
2<sup>nd</sup> International Workshop taught by: T. Lunne, J.J.M. Powell, Z. Młynarek et al.

## AWARDS

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3<sup>rd</sup> PhD thesis in the ALERT PhD prize 2010  
ZSoil 2010 Prize  
Research scholarship founded by the Swiss Government (2005-2006)  
Undergraduate scientific scholarship founded by the Cracow University of Technology (1997-2001)