

# Ing. Pavel Zach

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## CONTACT INFORMATION

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## EDUCATION

**University of West Bohemia**, Pilsen, Czech Republic

**Doctoral degree**, Faculty of Applied Sciences,  
09/2014 - present

- Specialization: Cybernetics and Control Engineering (Systems and Control)
- Main topic: *Methods of complex engineered systems with application in energy and biotechnologies*
- Advisor: Doc. Ing. Eduard Janeček, CSc., Daniel Georgiev, Ph.D.

**Master's degree**, Faculty of Applied Sciences,  
09/2012 - 06/2014

- Specialization: Information and Control Systems
- Graduated *cum laude*
- Thesis topic: *Systematic control of metabolite availability using models and methods of synthetic biology*
- Thesis advisor: Daniel Georgiev, Ph.D.

**Bachelor's degree**, Faculty of Applied Sciences,  
09/2009 - 06/2012

- Specialization: Cybernetics and Control Engineering (Systems and Control)
- Scholarships for excellence granted for the last year of study
- Thesis topic: *Analysis and implementation of regulatory mechanisms in the bacterium Escherichia coli*
- Thesis advisor: Daniel Georgiev, Ph.D.

## RESEARCH EXPERIENCE

**Control of Complex Systems Group - GCSC, ETSII, Universitat Politècnica de València, Valencia, Spain**

*Intern*

**02/2014 - 06/2014**

- Design, mathematical modeling and experimental characterization of RNA-based circuits
- Supervisors:
  - \* Jesús Pico i Marco (ai2)
  - \* Guillermo Rodrigo (IBMCP and CSIC)

**Cell Cybernetics Lab - CeCyL, University of West Bohemia, Pilsen, Czech Republic**

*Research Assistant*

**01/2011 till now**

- DNA recombinations, PCR and primer design, Gibson assembly
- Characterization of fluorescent proteins, bacterial transformations
- Site-directed mutagenesis, promoter tuning

## PUBLICATIONS

**Papers presented**

P. Zach, A. Vignoni, D. Georgiev, and J. Picó, "Alternativas de biología sintética para el control de rutas metabólicas", accepted to *Jornadas de Automatica*, Valencia, Spain, September 3-5, 2014. (ISBN-13: 978-84-697-0589-6, p. 891-898)

P. Zach, O. Mezhnina, T. Holubeva, "Isolation of photosynthetic proteins", poster presented at "*Schola Ludus*" - international summer school for university students and graduates, Nové Hradý, Czech Republic 2013.

P. Fikar, V. Babuška, V. Georgiev, G. Rousseau, P. Zach and D. Georgiev, "Dependence of dielectrophoretic forces on membrane proteins", poster presented at *The Sixth International Meeting on Synthetic Biology*, London, Great Britain 2013.

P. Zach, H. Kasl, V. Babuška and D. Georgiev, "Systematic Promoter Tuning In Negative Autoregulatory Transcription Networks", poster presented at *The Sixth International Meeting on Synthetic Biology*, London, Great Britain 2013.

P. Zach, and D. Georgiev "Realizace platformy pro systematické ladění negativních autoregulačních transkripčních sítí", oral presentation at the *FAV student scientific conference*, Pilsen, Czech Republic 2013. (Proceedings: ISBN 978-80-261-0238-0)

P. Zach, T. Puchrová and D. Georgiev "Platforma pro systematické ladění negativních autoregulačních transkripčních sítí", oral presentation at the *FAV student scientific conference*, Pilsen, Czech Republic 2012.

D. Georgiev and P. Zach, "Systematic tuning of a negative autoregulatory transcription network", poster presented at the first *Applied Synthetic Biology in Europe Meeting*, Barcelona, Spain 2012.

INDUSTRIAL  
EXPERIENCE**Self-employed - Flotacom**, Czech Republic*Web developer***05/2008 till now**

- Analysis, design and implementation of web applications for industry.
- Using PHP, MySQL and other technologies.

**XH CZ a.s.**, Czech Republic*Key account manager, Web developer***09/2006 - 02/2010**

- Design and implementation of various web-based applications.

## COURSES

**SynBioBoot - Cell Cybernetics Lab***Instructor***09/2013, 07/2014**

- The purpose of the course was to familiarise students with the process of DNA synthesis (restriction digest, PCR, Gibson assembly), bacterial transformation, fluorescence measurements and other lab techniques.

**System Biology Summer School - Global Change Research Center AS CR, v. v. i.**, Czech Republic*Participant***07/2013**

- Lectures and workshops focused on Systems Biology

**"Schola Ludus" - international summer school for university students and graduates - Academic and University Center Nove Hradý, Czech republic***Participant, supervisor M.Sc. Tatsiana Holubeva***06/2013 - 07/2013**

- Isolation of photosynthetic proteins
  - \* Isolation of thylakoid membrane from higher plants
  - \* Protein purification using ÄKTA purification machine
  - \* Gel electrophoresis, Western blotting

**3D modelling of biomechanical models - New Technologies - Research centre, Pilsen, Czech Republic**

*High school intern*

**06/2008 - 07/2008**

- Completion of 3D models in Amira and HyperMesh software

**AWARDS AND CONTESTS**

**FAV student scientific conference** **05/2013**

**Oral presentation:** *Realizace platformy pro systematické ladění negativních autoregulačních transkripčních sítí*

Second place in the category *Informatics, Cybernetics - Master's programmes*

**FAV, Faculty of Applied Sciences Dean's prize**

**06/2012**

Extraordinary thesis award

**FAV student scientific conference**

**05/2012**

**Oral presentation:** *Platforma pro systematické ladění negativních autoregulačních transkripčních sítí*

Second place in the category *Informatics, Cybernetics - Bachelor's programmes*

**TECHNICAL SKILLS** **Numerical computing** Matlab, Simulink, GNU Octave

**Programming languages** Java, PHP, Python

**Databases** MySQL

**Web** XHTML, CSS, JavaScript, AJAX

**Development tools** NetBeans

**LANGUAGE SKILLS** **English** Professional working proficiency

**Spanish** Limited working proficiency

**Russian** Elementary proficiency

**Czech** Native proficiency