Dipl. Phys. Yury V. Zaytsev

Present Affiliation

Ph. D. Student at Functional Neural Circuits Group, Bernstein Center Freiburg, University of Freiburg

Hansastraße 9a,
79104 Freiburg im Breisgau,
Germany

Mobile: +49 (1578) 455-33-22
Office: +49 (761) 203-95-65
Fax: +49 (761) 203-95-59

E-mail: yury@zaytsev.net
Web: yury.zaytsev.net

Personal Details

Language skills: English (fluent), French (fluent), German (intermediate), Russian (native)
Citizenship: Russian

Research Interests

I am interested in statistical data analysis and modeling techniques with application to establishing relationships between effective, functional and anatomical connectivity in neural circuits. In conjunction with computer modeling of the complex dynamics of large populations of neurons and highly parallel network simulations, I hope to provide a link to higher level cognitive functions.

Education

University of Freiburg, Freiburg i. Br., Germany

09/2009 – present: Ph. D. Student at Bernstein Center Freiburg

- Thesis: "Inferring effective connectivity of neuronal networks from spike data"
- Thesis Adviser: Jun. Prof. Dr. Abigail Morrison

Nizhny Novgorod State University, Nizhny Novgorod, Russia

09/2004 – 06/2009: Dipl. Phys. in "Fundamental Radiophysics and Physical Electronics", Chair for Neurodynamics and neurobiology

- Diploma: "Recovering the structure of synaptically coupled neural network from multi-channel cell activity recordings"
- Diploma Adviser: Prof. Dr. Victor B. Kazantsev
- GPA: 4.75 / 5.0 (with honors)

Teaching Experience

- Tutoring and lecturing for the "Scientific Programming — An Introduction to Python / Scientific Python" course (4 ECTS) organized by Bernstein Center Freiburg (**2010, 2011**)
- Tutoring for the NWG Course "Analysis and Models in Neurophysiology": exercises in Matlab for "Spike Train Statistics and Correlation Measures" and "Local Field Potentials and Synaptic Plasticity" lectures (**2009 – 2011**)
- Tutoring and grading for the "Introduction to Neurobiology IV: Systems and Signals" course, BCF / Faculty of Biology, University of Freiburg (**2010**)

Schools and Internships

- Awarded a "Google Summer of Code" stipend to develop Continuous Integration Infrastructure for NEST Simulator, mentored by INCF and NEST Initiative (**2011**)
- Completed 3^{rd} G-Node Winter Course in Neural Data Analysis, Munich, Germany (**2011**)
- Guest scientist at Physikalisch-Technische Bundesanstalt (PTB), Braunschweig, Germany (September, 2008); the project involved programming a FPGA-based `NI-RIO MultiIO` card to be used as a part of a PID circuit (**2008**)
- Internship in numerical simulations and visualization of transcranial ultrasound wave propagation at "Laboratoire Ondes et Acoustique" (LOA ESPCI), Paris, France (July – August, 2008); worked on custom finite differences simulation code, as well as MATLAB scripts for data analysis and visualization (**2008**)
- Completed "Models in neuroscience: turning experiments into knowledge" School in the framework of Programme of European Neuroscience Schools, St.-Petersburg, Russia (**2008**)

Seminars and Talks

- Invited talk at the BrainScaleS CodeJam Workshop #5, Edinburgh, UK (**2012**)
- Invited seminar "Detecting sources of simultaneous firing in spiking neuronal network" at Bernstein Center for Computational Neuroscience Berlin, Germany (**2008**)

Technical Skills

- **Scientific Software**: CAS (MATLAB, Mathematica, Maple), visualization and analysis (Veusz, Origin, SYSTAT), neural network simulators (NEST), iPython (NumPy / SciPy / Matplotlib)
- **Programming Languages**: Python, Pascal (proficient); C, C++, Java, Perl, PHP, JavaScript, Bash scripting, x86 assembler, SQL (familiar); HTML & CSS (markup)
- **Development Workflows**: project management software (Trac, Launchpad, Bugzilla), VCS (Git, Subversion), build systems (Autotools, CMake), code analysis (lint, valgrind, etc.)
- **Productivity**: LaTeX, BibTeX, OpenOffice / Microsoft Office, graphics (GIMP, Inkscape, Dia)
- **Hardware**: National Instruments DACs (LabView), MultiChannel Systems DACs and signal generators, Linux-based SoC boards / embedded systems (e. g. TI AR7)
- **Information Technology**: Red Hat (contributor to RepoForge / RPMForge since 2007) and Debian (contributor since 2010) Linux (proficient), Solaris and other UNIX variants, Microsoft Windows (limited); networking (transport and applications layers), services (web, database, mail, file, name servers), system administration (provisioning, redundancy, firewalls, monitoring, grid computing)

Refereed Journal Publications

[1] Zaitsev, V., Gusev, V., **Zaytsev, Yu.** Mutually induced variations in dissipation and elasticity for oscillations in hysteretic materials: non-simplex interaction regimes. *Ultrasonics*, 43, (2005) 699–709

Conference Publications

[2] **Zaytsev, Yu.**, Kazantsev, V. Detecting synchronizing signals in spiking neuronal networks. *Proc. of The Intern. Conf. "Dynamic Days Europe 2008"*, Delft, The Netherlands, 25–29 August 2008, TUDelft, p. 85

[3] **Zaytsev, Yu.**, Kazantsev, V. Detecting sources of simultaneous firing in neuron network spiking data. *Proc. of The Intern. Conf. "*10^{th} *Experimental Chaos Conference"*, Catania, Italy, 3–6 June 2008, ECC10 Abstract Booklet, Ed. Giuseppe Maimone, p. 186

[4] Zaitsev, V., Gusev, V. and **Zaytsev, Yu**. Effect of hysteresis saturation on nonlinear interaction of elastic waves in materials with hysteretic nonlinearity. *Proc. of the XIX-th Session of the Russian Acoustical Society*, Nizhny Novgorod, 24–28 September 2007, vol. 1, Moscow, GEOS Publ., p. 185–189 (in Russian) [English version available]

[5] Zaitsev, V. Yu., Gusev, V. E., **Zaytsev, Yu. V.** Effect of hysteresis saturation on nonlinear interaction of elastic waves in materials with hysteretic nonlinearity. *Proc. of the XI-th Scientific Conference on Radiophysics*, Nizhny Novgorod State University, 7–11 May 2007, p. 182–183 (in Russian) [available online]

[6] Koshelev, M. A., Tretyakov, M. Yu., **Zaytsev, Yu. V.**, Romanova, V. I. Broadening and shift of the spectral line of H_2O molecule at 325 GHz induced by the pressure of the main atmospheric gases. *Proc. of the X-th Scientific Conference on Radiophysics*, Nizhny Novgorod State University, 2 pages (in Russian)

[7] Zaitsev, V. Yu., Gusev, V. E., **Zaytsev, Yu. V.** Mutually-induced variations in dissipation and elastic moduli for non-simplex interaction of oscillations in hysteretic media. *Proc. of XVI-th Session of Russian Acoustical Society*, Moscow, 14–18 November 2005, vol. 1, Moscow, GEOS Publ., p. 311–314 (in Russian) [English version available online]

[8] **Zaytsev, Yu. V.**, Gusev, V., Zaitsev, V. Yu. Non-simplex Interaction of Oscillations in Hysteretic Materials: Mutually Induced Variations in Dissipation and Elasticity. *CD-Proc. Int. Symp. "Forum Acusticum 2005"*, Budapest, 29 Aug. – 2 Sep. 2005, p. 1379–1384

[9] Zaitsev, V. Yu., Gusev, V. E., **Zaytsev, Yu. V.** Nonlinearly-induced variations in dissipation and elasticity at non-simplex interaction of oscillations in hysteretic materials. *Proc. of IX-th Conference on Radiophysics*, Nizhny Novgorod State University, 7–12 May 2005, Nizhny Novgorod, TALAM Publ., p. 265–266 (in Russian) [available online]

Referee Service

- Technical reviewer for Packt Publishing (2010)

Miscellanea

- Language certifcates:
  - **IELTS** (English) certificate with overall band score of 8.0 out of 9.0 (2009)
  - **SD A1** (German) at Goethe-Institut, Sprachlernzentrum Nischnij Nowgorod (2009)
  - **DALF C1** (French) in sciences at Alliance Française de Nijni Novgorod (2006)
- Contributions to various Open Source projects:
  - NEST Spiking Neural Network Simulator (since 2010)
  - Repositories and profile on GitHub: https://github.com/zyv
  - Accepted patches in Red Hat Enterprise Linux, Ubuntu, Debian, RepoForge / RPMForge, Midnight Commander, Jenkins, e2fsprogs, mrepo, mock, Puppet, Cython, mpi4py, NumPy, Phorum, CMS Made Simple and many others
- PGP encryption/signing key: `0xBCBB E0EF`

References

Academic references and recommendation letters from commercial clients are available upon request.