

# Sergii Zhevzhyk

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## Experience

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### Kapsch TrafficCom AG

Senior Software Engineer

Klagenfurt

2019–

- Design and development of an innovation platform for streaming and processing of data. Used technologies: *Java, Apache Pulsar, Apache Flink, Spring Boot, Kubernetes, Helm, Ansible*

### Kapsch TrafficCom AG

Software Engineer

Klagenfurt

2016–2019

- Development of a scalable system based on the microservice architecture for receiving and processing of incoming data from On-Board-Units. Used technologies: *Java, Spring Boot, RabbitMQ, Ansible, Docker, Elastic, PostgreSQL*

### Alpen-Adria-Universität

Researcher and PhD Student

Klagenfurt

2013–

- Implementation of an open-source framework for evolving and evaluating of self-organizing systems. Used technologies: *Java, Python*
- Hardware and software development for an investigation of collective behavior in the field of swarm robotics. Used technologies: *C/Arduino, PCB Design, C#/Unity*

### Ukrainian Railways

Software Developer

Donetsk

2009–2013

- Development of a specialized .NET ORM system that is used for loading, maintaining and filtering a large amount of data, providing application servers and workstations with information about processes in the railway sector. Used technologies: *.NET, ORM, ADO.NET, Oracle, ODP.NET, XML, XSLT*
- Implementation of a GPS transport tracking system for monitoring and automatic reporting about the movements of locomotives. Used technologies: *.NET, LINQ, Oracle, NHibernate*
- Organization of a railway automation to information system interaction for receiving of detailed information about trains' positions. Used technologies: *.NET, XML*

## Education

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### Donetsk National Technical University

Master's degree in Computer Engineering with distinction

Donetsk

2009–2011

### Donetsk National Technical University

Bachelor's degree in Computer Engineering with distinction

Donetsk

2005–2009

## Awards

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- Hackathon "What the hack" (2016) — 1st place
- IEEEExtreme 9.0 (2015) — 1st place in Austria
- IEEEExtreme 8.0 (2014) — 2nd place in Austria
- IEEEExtreme 7.0 (2013) — 1st place in Austria

## Languages

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**English:** Professional working proficiency

**German:** Limited working proficiency

**Ukrainian:** Native proficiency

**Russian:** Native proficiency

## Interests

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Reading, alpine skiing, traveling

## Publications

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- **Comparison of Metaheuristic Algorithms for Evolving a Neural Controller for an Autonomous Robot**  
Evolutionary algorithms are a possible way to automatically design the behavior of autonomous robots. In this paper we compare different evolutionary algorithms (EA), namely simple EA, two dimensional cellular EA, and random search, according to their performance in a simple simulation, where a phototaxis robot with two sensors of limited range has to find a light source in a closed area. In our experiments we studied the effects on performance of EA parameters, such as population size and number of generation. The results explain how the choice of the neural network (three-layered or fullyconnected) may influence the quality of a final solution.
- **A low-cost robot for multi-robot experiments**  
This paper presents a design for a low-cost research robot based on the chassis of a Hexbug Spider, a remote controlled toy robot. Our modification replaces the robot head with a 3d printed adapter part which provides space for sensors, a larger battery, and a microcontroller board. In a second part of the paper we address the manufacturing process of such a robot. The presented robot costs far less than 100 Euro and is suitable for swarm robotic experiments. The hexapod locomotion makes the robot attractive for applications where a two wheel differential drive cannot be used. Our modification is published as open hardware and open source to allow further customizations.
- **HEMS: a home energy market simulator**  
Stability issues in the electric power grid originate from the rising of renewable energy generation and the increasing number of electric vehicles. The uncertainty and the distributed nature of generation and consumption demand for optimal allocation of energy resources, which, in the absence of sufficient control reserve for power generation, can be achieved using demand-response. A price signal can be exploited to reflect the availability of energy. In this paper, market-based energy allocation solutions for small energy grids are discussed and implemented in a simulator, which is released for open use. Artificial neural network controllers for energy prosumers can be designed to minimize individual and overall running costs. This enables a better use of local energy production from renewable sources, while considering residents' necessities to minimize discomfort.
- **Investigating the self-organization of debris flows: theory, modelling, and empirical work**  
The conceptual framework of an interdisciplinary project on the theory, empirics, and modelling of the self-organisation mechanisms within debris flows.