

# LENKA PITONAKOVA

## CURRICULUM VITAE

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A researcher with extensive software development experience. Specialised in agent-based modelling, big data applications, games and web development. Research interests include autonomous multi-robot systems, neural networks and biologically inspired artificial intelligence. Innovative, creative and able to quickly understand new concepts.

### TECHNICAL SKILLS

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- **Object-oriented** (C++, Objective-C, C#, Java, ActionScript) **and functional** (C, Python, PHP) **programming**
- **Database development** (PostgreSQL, MySQL) and **big data analysis**
- **Mobile app development (iOS / Android):** Google maps API, web-driven content, Bluetooth
- **Embedded and parallel software development**
- Web development and graphic design: **PHP** (general, Codeigniter), **HTML** and **CSS**, **JavaScript**, **JQuery**, **Ajax**, **REST**, **OAuth**, Search Engine Optimisation and cross-browser coding
- **Developer tools** (Bash scripts, git) and **test-driven development**
- Good working knowledge of **software design patterns** and **software carpentry** best practises

### WORK EXPERIENCE

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03/2018 – now  
University of Bristol  
(Bristol, UK)

#### Research associate: Hybrid Autonomous Systems Engineering

Working on life-course autonomy of hybrid autonomous systems achieved through novelty detection with neural networks and collective decision making.

10/2017 – 02/2018  
University of West England  
(Bristol, UK)

#### Research associate: Robotics for Nuclear Environments

Collaboration on developing a C++ simulation environment for the project.

03/2017 – 03/2018  
University of Southampton &  
Bristol Robotics Laboratory  
(Bristol, UK)

#### Post-doctoral research fellow

Independent research titled Design Patterns for Robot Swarms. Working on measuring information flow and developing algorithm design principles for robot swarm foraging, using e-puck robots.

10/2015 – 02/2016  
Flowminder Foundation  
(Southampton, UK / Geneva,  
CH)

#### Data scientist, software developer

Employed as a Python developer with expertise in object-oriented software engineering. Worked on a large-scale application that processed mobile phone data in order to aid disaster response for the United Nations and other relief agencies.

09/2007 – 10/2017  
Various companies and  
freelance work

#### Software developer: Junior - senior

Worked on individual and team projects within the industry and the academia, including big-data applications, user behaviour tracking and social media applications, a large-scale PHP-based Content Management System and a number of iOS games and applications. Gained experience in the full software development cycle, team management, marketing and in communication with clients.

## RESEARCH OUTPUTS AND OUTREACH ACTIVITIES

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- Internationally recognised journal and conference papers, including publications in **Swarm Intelligence, Adaptive Behaviour, IROS and ALIFE** conferences (<http://lenkaspacenet.info/publications>)
- **Teaching and project supervision** experience with students at PhD, Masters and Bachelor's levels
- Participated in a number of **outreach activities**, including organising an international conference on complex systems, as well as various public science events and talks

## RESEARCH GRANTS AND AWARDS

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03/2017 – 02/2018	EPSRC Doctoral Prize Research Fellowship	£35,000
09/2012 – 02/2017	EPSRC Doctoral Training Centre Grant	£120,000
06/2008	General Motors Scholarship based on academic achievement	£1,000

## SELF-FUNDED PROJECTS

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- **The Hive Mind:** An educational 3D game about swarm robotics (<http://thehivemindgame.net>)
- **pyCreeper:** An open-source python library for plotting (<http://pycreeper.lenkaspacenet>)
- **Creeper:** An open-source Java framework for agent-based simulations (<http://lenkaspacenet/code/java/creeper>)
- **Stardust Colonies:** A strategy game with its own C++ game engine (<http://stardustcolonies.lenkaspacenet>)
- **UIn Library:** An open-source NXC framework for creating user interfaces on the Lego Mindstorms brick (<http://lenkaspacenet/lab/legoMindstorms/nxcUserInteractionLibrary>)
- **Alien Strike:** An iPhone space shooter game (<http://lenkaspacenet/code/objectiveC/alienStrike>)

## QUALIFICATIONS

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09/2012 – 01/2017 University of Southampton (Southampton, UK)	<b>PhD Simulation of complex systems / Swarm robotics</b> A fully funded Doctoral Training Centre programme. My thesis title was "Design Patterns for Robot Swarms". In my research, I developed a novel way of understanding robot swarm behaviour in terms of information flow and showed how it can be applied for robot behaviour design.
10/2009 – 09/2011 University of Sussex (Brighton, UK)	<b>MSc Evolutionary and adaptive systems (Distinction)</b> Courses covered artificial intelligence, genetic algorithms, neural networks and dynamical systems. My thesis was titled "Ultrastable Neuroendocrine Robot Controller" and proposed a novel learning algorithm for a neural network robot controller, that led to a journal publication.
09/2006 – 06/2009 University of Bedfordshire (Luton, UK)	<b>BSc Computer Games Development (First class)</b> Courses included games design and development with Java, C++, OpenGL and DirectX. For my dissertation, I developed a C++ strategy game that used fuzzy logic for game unit AI.

## INTERESTS

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Creative writing, drawing, computer games, playing guitar