

Postdoc position in NeuroRobotics at the SPECS-lab Research Group

Description of the position:

The [SPECS Research Group](#) is offering a Postdoc position in NeuroRobotics. The successful candidate will lead SPECS' NeuroRobotics lab and drive the research on Cognitive Architectures in the context of the Distributed Adaptive Control theory of mind and brain that SPECS-lab has been elaborating over many years [1, 2, 3, 4].

We are seeking a candidate to advance the DAC Architecture towards a whole brain implementation, which maps this cognitive architecture to the main structures of the mammalian brain. We will test these models on robots both targeting rodents level tasks such as foraging and navigation but also, we want to look at human level tasks such as social interaction and motor rehabilitation. The candidate will work directly with the director of SPECS-lab, ICREA Professor Dr. Paul Verschure.

1. Verschure, Paul FMJ. "Synthetic consciousness: the distributed adaptive control perspective." *Philosophical Transactions of the Royal Society B: Biological Sciences* 371, no. 1701 (2016): 20150448.
2. Verschure, PFMJ, Pennartz, CM, & Pezzulo, G. (2014). The why, what, where, when and how of goal-directed choice: neuronal and computational principles. *Phil. Trans. R. Soc. B*, 369(1655), 20130483.
3. Verschure, P. F. (2012). Distributed adaptive control: a theory of the mind, brain, body nexus. *Biologically Inspired Cognitive Architectures*, 1, 55-72.
4. Verschure, PFMJ T Voegtlin T, RJ Douglas (2003) - Environmentally mediated synergy between perception and behaviour in mobile robots Nature - pdfs.semanticscholar.org

The successful candidate will:

- **Conduct research in areas of cognitive architectures, motivational systems and social robotics:**
In particular, the research aims at the development of advanced biologically grounded cognitive architectures responsible for the control of humanoid and mobile robots, the generation of advanced and psychologically and ethologically plausible robot behaviour, the implementation of an cognitive, emotional and motivational system of synthetic agents, as well as the study of collaboration between humans and robots.
- **Contribution to ongoing and future research projects:**
Participate and be involved in managing European projects, in particular two ongoing EC projects with emphasis on robot cognitive architectures: HR-Recycler (<https://www.hr-recycler.eu/>) and ReHyb (<https://rehyb.eu/>).
- **Student supervision:**
The supervision of students includes providing ideas/projects for undergraduate, master and PhD thesis and guidance of the projects. Further student supervision includes master students, bachelor students as well as other students in summer schools and extra scholar activities.
- **Outreach activities:**
Outreach activities aim at showcasing the work from the lab at conferences, fairs, and to the general public.

Requirements for candidates:

- **Experience:**
The successful candidate has experience in some of the following topics:
Machine learning for robotics (e.g., reinforcement learning, deep learning),
Computational neuroscience, Embodied artificial intelligence, Bio-inspired robotics,
Control systems, Humanoid robots, mobile/field robotics,

exoskeletons, Bio-inspired computing, e.g., artificial neurons, Human-Robot Interaction (HRI) and Human-Robot Collaboration (HRC).

Additionally, the candidates should have excellent programming skills (e.g., C, C++, Python), proven writing skills, self-propelled and a team player. Familiarity with tools such as ROS, robot simulation (V-REP), TensorFlow, MatLab, and Git is desirable.

- **Degrees/desired profile.**
Master/PhD in Artificial Intelligence/Machine Learning, Robotics, Electrical Engineering and Computer Science, Computational Neuroscience, or equivalent.
 - Competencies and skills: Communication, Teamwork, Commitment, Proactivity,
 - High level of English

We Offer:

- Number of available positions: 1
- Starting date: **January 2021**

Working conditions:

- Full time 3-year contract.
- Very competitive salary.
- Measures to reconcile work and family life (maternity and paternity leave, flexible schedule working hours, teleworking, 23 working days of paid holidays, 9 leave days for personal matters, among others).
- SPECS is at the center of a broad international network through Living Machines and BCBT <https://bcbt.specs-lab.com/bcvt19/>
- Professional development opportunities: the host of SPECS, IBEC, has a Training catalogue in technical and transferable skills and organises seminars and PhD discussions. Mobility grants are offered. Mentoring program for Postdoctoral researchers.
- Onboarding program to facilitate incorporation at SPECS and additional support is provided to obtain Visa, work permit and to get settled in Barcelona.

Application:

The candidate application must include:

- A covering letter explaining his/her approach to challenges listed in the profile
- Curriculum Vitae including google scholar citations
- Certificates (Bachelor, Masters' degree and PhD degree)
- The PDFs of at least 3 articles illustrating the candidate's publication record
- The full publications list of the candidate

How to apply:

Interested applicants should send their CV, cover letter and the contact of two referees to: jobs@ibeccarcelona.eu before the end of November 2020.

Principles of the selection process:

SPECS is committed to the principles of the Code of Conduct for the Recruitment of Researchers of the European Commission and the Open, Transparent and Merit based Recruitment principles. Thus, there are no restrictions of citizenship or gender and candidates with disabilities are strongly encouraged to apply.

Who we are?

SPECS-lab is an interdisciplinary research laboratory directed by Catalan Institute of Advanced Studies research professor Paul Verschure. SPECS focuses on advancing a theory of mind and brain which is validated in the empirical investigation of the brain through work with intracranially implanted epilepsy patients, computational principles of learning and memory, decision-making and spatial memory, biologically grounded neurorobotics, neurorehabilitation after brain damage, and advanced neuroinformatics tools for analyzing and accessing complex brain data. SPECS' research spans Neuroscience, Robotics, Artificial Intelligence, Virtual and Mixed Reality and the application areas of Neurorehabilitation, Education, and Cultural Heritage. SPECS-lab comprises a multidisciplinary team of 30 doctoral and post-doctoral researchers and has published over 400 articles in leading journals. SPECS is part of an advanced innovation and transfer pipeline via its spin-off Eodyne Systems which brings science grounded neurorehabilitation to society. SPECS is centrally involved in the annual Living Machines conference, the annual Barcelona Cognition, Brain and Technology summer school and hosts the Convergent Science Network podcast. For more information go to <https://specs-lab.com>

SPECS-lab is hosted by the Institute for Bioengineering of Catalonia, IBEC (www.ibebarcelona.eu) is an interdisciplinary research center focused on Bioengineering and Nanomedicine based in Barcelona. IBEC is one of the top research institutions named as a Severo Ochoa Research Centre by Ministry of Economy and Competitiveness (in charge of research and innovation policy in Spain), which recognizes research excellence at the highest international level IBEC is located within the Barcelona Science Park and at the UPC campus Besos in Barcelona. IBEC comprises 21 research groups together with administrative services employing a total of 300 people from 30 different countries