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Bio-inspired design: A perspective for aerial micro robots.

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Abstract: Biologically inspired design is an engineering synthesis approach for artificial systems that are conceptually inspired from biology. Its premise is the creation of unconventional mechanical solutions that have the potential to outperform classical engineering designs. In the field of flying micro robots, bioinspired design principles such as flapping wing flight or optical flow based navigation are often employed but it is not always clear where exactly and how the biological systems act as a source of inspiration. In this talk, I will formalize successful bioinspired design strategies in the perspective of flying micro robot development. For illustration, I will present a number of bio-inspired robotic case studies that focus on multi-modal locomotion that can greatly improve the mobile capabilities of micro robots in rough terrain. I will also give an overview on the implications of the insights from our robotics research on biological questions related to multi-modal locomotion in evolutionary biology.

Biography: Dr. Mirko Kovac is director of the Aerial Robotics Laboratory at the Aeronautics Department at Imperial College London. His research interest is the conception and design of novel morphologies and locomotion methods for mobile robots and their analogy in biological systems. Before his appointment in London, he was post-doctoral researcher at the Harvard Microrobotics Laboratory as part of the Wyss Institute for Biologically Inspired Engineering at Harvard University in Cambridge, USA. He obtained his PhD with the Laboratory of Intelligent Systems at the Swiss Federal Institute of Technology in Lausanne (EPFL). He received his M.S. degree in Mechanical Engineering from the Swiss Federal Institute of Technology in Zurich (ETHZ) in 2005.During his studies he was research associate with the University of California in Berkeley USA, RIETER Automotive Switzerland, the WARTSILA Diesel Technology Division in Switzerland, and CISERV in Singapore. Since 2006, he has presented his work at numerous international conferences and in journals and has won several bestpaper and best presentation awards. Also, he is invited member of the scientificadvisory board of the Lifeboat Foundation, has been invited lecturer at more than 20 research institutions world wide and has been representative speaker on education and innovation at the World Knowledge Dialogue Symposium 2008 and the EPFL Didactic Days Conference 2008.

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