Abstract:

A number of challenges of the modern world could potentially be resolved on the low level with innovative materials. However, new types of materials need to be designed for such applications, with some characteristics of biological systems: those with self-healing capabilities, with memory functions, those which can evolve differently depending on external conditions. I will be discussing the methodologies to design such artificial living systems and the areas of their applications. As AI is playing a crucial role in the process – I will discuss a variety of AI approaches for the materials design. Also, a very important stream is the materials for AI: I will consider the utilisation of new materials for novel, beyond von Neumann computational solutions, which allows significant reduction on the power consumption of modern data centres.