

2018 The 1st Meeting of EMP Seminar Series

2018 第1回 EMP セミナーシリーズ

共催：システム情報工学研究科 コンピューターサイエンス専攻

Program for Leading Graduate Schools

Held by Ph.D. Program in Empowerment Informatics & Department of Computer Sciences (Graduate School of SIE)

Host : Ko Sakai, Professor (Faculty of Engineering, Information and Systems)



PH.D. PROGRAM IN
EMPOWERMENT
INFORMATICS

Graduate school of SIE, University of Tsukuba
Department of Computer Science

Presenter

Dr. J. Michael Herrmann

University of Edinburgh,
School of Informatics and
Edinburgh Centre for Robotics



Critical Brains for Autonomous Robots

Date & Time

April 11, 2018(Wed.) **13:45 - 15:45**

Venue

3B204

Self-organized criticality, according to Per Bak (1996), describes the way how nature works. While this is an intriguing perspective in the sciences, it is considered here as an interesting approach to robotics. In the talk, we will discuss benefits of critical dynamics in robotics and in particular behavioural optimisation, self-motivated learning and seamless interaction. We start by reviewing critical networks in real neutral systems and move on to embedded robots, applications in prosthetics and the generation of complex behaviour in robot swarms. While there examples might be sufficient to make a case for critical robots, it will also become clear that this approach is yet to realise its full potential. Currently problems are often due to the fact that robots usually have to serve a specific purpose, which is at odds with the exploratory nature of critical dynamics. As a solution, we present the concept of guided self-organisation which can reconcile criticality-derived flexibility and the goal-directedness required in robotic applications.