



**Séminaire ISIR**  
Jeudi 19 octobre 2017 à 14H00

**Tamar Flash**

Campus Jussieu, 4 place Jussieu, Paris  
**Salle de réunion 304**

---

## On the compositionality, timing and coordination of complex movements.

**Abstract :** In my talk I will discuss several research directions taken to explore different principles underlying the construction and control of complex movements which are of interest for robotics. One important topic is motor compositionality, examining the nature of the primitives underlying the construction of complex movements at different levels of the motor hierarchy. Another topic is motor timing, investigating the principles dictating the timing of complex motor behaviors regarding the durations of both different motion segments and the total movement durations. Finally the third topic to be discussed is motor coordination and the mapping between end-effector and joint motions for both upper limb and locomotion movements using various dimension reduction approaches. The mathematical models applied combine optimization models and geometrical approaches. Finally I will discuss studies of the control of octopus movements which have an inspiration for soft robotics.

**Short bio :** Tamar Flash is a professor at the Department of Computer Science and Applied Mathematics, Weizmann Institute of Science, Israel. She earned her BSc and MSc degrees in Physics from the Tel-Aviv University, Israel. She received her Ph.D. in Medical Physics from the Massachusetts Institute of Technology (1983) where she enrolled in the Harvard-MIT Division of Health Science and Technology. She continued with her postdoctoral training at MIT, at the Department of Brain and Cognitive Science and the Artificial Intelligence Laboratory (1983-1985). In 1985 she joined the Department of Computer Science and Applied Mathematics at the Weizmann Institute of Science where she established a research group, focusing on motor control and robotics and also served as the department head (2004-2007). She was a visiting professor at MIT, the College de France, Berkeley University and a fellow at the Radcliffe Institute for Advanced Studies, Harvard University.