



THE WEIZMANN INSTITUTE OF SCIENCE  
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Vision and Robotics Seminar

Room 1 ,Ziskind Building  
on Thursday, Apr 27, 2017  
at 12:15

Tamar Flash  
Weizmann Institute

Motion compositionality and timing: combined geometrical and optimization  
approaches

Abstract:

In my talk I will discuss several recent research directions that we have taken to explore the different principles underlying the construction and control of complex human upper arm and gait movements. One important topic is motor compositionality, exploring the nature of the motor primitives underlying the construction of complex movements at different levels of the motor hierarchy. The second topic which we focused on is motion timing, investigating what principles dictate the durations of complex sequential behaviors both at the level of the internal timing of different motion segments and the total durations of different types of movement. Finally I will discuss the topic of motor coordination and the mapping between end-effector and joint motions both during arm and leg movements using various dimension reduction approaches. The mathematical models we have used to study the above topics combine geometrical approaches with optimization models to derive motion invariants, optimal control principles and different conservations laws.