



Information, Control, and Learning – The Ingredients of Intelligent Behavior

September 26-28, 2016

The Brindell and Milton Gottlieb Auditorium, The Rothberg Family buildings,
Rachel and Selim Benin School of Computer Science and Engineering
Edmond J. Safra Campus, Jerusalem

Organizing committee: Naftali Tishby, Yair Weiss and Israel Nelken

Monday, September 26, 2016

9:00-9:10 – **Eilon Vaadia** – Director of ELSC, *The Hebrew University of Jerusalem, Israel* –
Opening words

Session 1: Information & Control - What's the connection?

9:10-10:00 – **Naftali Tishby** – *The Hebrew University of Jerusalem, Israel* –
The Synergy between Information and Control

10:00-10:45 – **Sanjoy Mitter** – *Massachusetts Institute of Technology, USA* –
Information and Entropy Flow in Estimation and Control

10:45-11:15 – *Coffee break*

11:15-12:00 – **Susanne Still [Video talk?]** – *University of Hawaii, USA* –
Optimal Information Processing: Dissipation and Irrelevant Information

12:00-12:45 – **Bert Kappen** – *Radboud University, Netherlands and University College
London, UK* – Integrating control, inference and learning. Is it what the brain does?

12:45-14:15 – *Lunch*

Session 2: Sensorimotor Loops and Decision Making

14:15-15:00 – **Kenji Doya** – *Okinawa Institute of Science and Technology, Japan* –
Neural Circuit Mechanisms of Mental Simulation

15:00-15:45 – **Daniel Wolpert** – *University of Cambridge, UK* –
Sensorimotor decisions

15:45-16:15 – *Coffee break*



16:15-17:00 – **Yifat Prut** – *The Hebrew University of Jerusalem, Israel* –
Inhibitory control of motor timing

17:00-17:45 – **Fritz Sommer** – *University of California, Berkeley, USA* –
Information-theory based policies for exploratory learning in sensorimotor loops

Tuesday, September 27, 2016

Session 3: Cognition and Embodiment

9:00-9:45 – **Andrea Cavagna** – *Institute for Complex System, Italy* –
Information transfer and behavioral inertia in starling flocks

9:45-10:30 – **Shai Shalev-Shwartz** – *The Hebrew University of Jerusalem & Mobileye, Israel* –
Deep Reinforcement Learning for Driving Policy

10:30-11:00 – *Coffee break*

11:00-11:45 – **Nihat Ay** – *Max Planck Institute for Mathematics in the Science, Germany* –
Mathematical Aspects of Embodied Intelligence

11:45-12:30 – **Daniel Polani** – *University of Hertfordshire, UK* –
Informational Drivers of Cognition

12:30-14:00 – *Lunch*

Session 4: Neural coding and representation

14:00-14:45 – **Reza Shadmehr** – *Johns Hopkins University, USA* –
Encoding of action by the Purkinje cells of the cerebellum

14:45-15:30 – **Ron Meir** – *Technion – Israel Institute of Technology, Israel* –
Optimal Neural Codes for Estimation and Control

15:30-16:00 – *Coffee break*

16:00-16:45 – **Máté Lengyel** – *University of Cambridge, UK* –
Neural variability and sampling-based probabilistic representations in the visual cortex

16:45-17:30 – **Tatyana Sharpee** – *Salk Institute for Biological Studies, USA* –
How Invariant feature selectivity is achieved in cortex



Wednesday, September 28, 2016

Session 5: Learning to decide and behave

9:00-9:45 – **Alexandre Pouget** – *University of Geneva, Switzerland* –
Optimal policies for value-based decision making

9:45-10:30 – **Satinder Singh Baveja** – *University of Michigan, USA* –
Rethinking State Action and Reward in Reinforcement Learning

10:30-11:00 – *Coffee break*

11:00-11:45 – **Shie Mannor** – *Technion – Israel Institute of Technology, Israel* –
Regularization and Robustness in Reinforcement Learning

11:45-12:30 – **Takashi Tanaka** – *KTH Royal Institute of Technology, Sweden* –
LQG Control with Minimum Directed Information: A Semidefinite Programming Approach

12:30-14:00 – *Lunch*

Session 6: Predictions, Adaptation and Planning

14:00-14:45 – **Naama Brenner** – *Technion – Israel Institute of Technology, Israel* –
Exploratory adaptation in random networks

14:45-15:30 – **Amir Globerson** – *Tel Aviv University, Israel* –
Variational Conditional Probabilities

15:30-16:00 – *Coffee break*

16:00-16:45 – **Israel Nelken** – *The Hebrew University of Jerusalem, Israel* –
Information-theoretic bounds and brains: prediction and planning

16:45-17:30 – Discussion & Conclusions