1st Workshop on Biological Distributed Algorithms (BDA 2013)

14 October 2013, Jerusalem, Israel – in conjunction with DISC 2013

BDA 2013 Preliminary Schedule

Posted on **August 29, 2013**

8:30am — Welcome Remarks

Session 1. Chair: Yuval Emek

8:35-9:05am [Invited talk]: *"Executable Biology: Successes and Challenges".*
J. Fisher (Microsoft Research UK and Univ. of Cambridge.*)*

9:05-9:30am [Contributed talk]: *"Firefly Synchronization with Asynchronous Wake-up"*
D. Alistarh (USA, MIT), A. Cornejo (USA, Harvard), M. Ghaffari (USA, MIT), and N. Lynch (United States, MIT).

9:30am-10:00am [Invited talk]: *"Synaptic Pruning: An Algorithmic Perspective"*
S. Navlakha (USA, CMU).

10:00-10:30am [Invited talk]: *"Integrating Theoretical Algorithmic Ideas in Empirical Biological Study"*
A. Korman (France, CNRS and Univ. of Paris Diderot)

10:30-11:00am — Break

Session 2. Chair: Amos Korman

11:00-11:30am [Invited talk]: *"Fighting noise with limited resources: an ant colony perspective"*
[removed movies for technical reasons]
O. Feinerman (Israel, Weizmann Institute).

11:30am-12:00pm [Invited talk]: *"Robust computing over networks : Lessons from nature"*
Z. Bar-Joseph (USA, CMU).

12:00-12:25pm [Contributed talk]: *"The Power of Pheromones in Ant Foraging"*
C. Lenzen (USA, CSAIL MIT) and T. Radeva (USA, CSAIL MIT).

12:25-12:55pm [Invited talk]: *"Distributed computing on the (fruit) fly"*
Y. Emek (Zurich, ETH).

12:55-14:30pm — Lunch break

Session 3: Chair Ziv Bar-Joseph

14:30-15:20pm [Keynote]: *"Evolutionary tradeoffs and the geometry of phenotype space"*
U. Alon (Israel, Weizmann Institute).

15:20-15:45pm [Contributed talk]: *"Ameba-inspired Self-organizing Particle Systems"*
S. Dolev (Israel, Ben-Gurion Univ.), R. Gmyr (Germany, Univ. of Paderborn), A.W. Richa (USA, Arizona State Univ.), and C. Scheideler (Germany, Univ. of Paderborn).

15:45-15:50pm Closing remarks

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Announcing BDA 2013

Posted on **April 3, 2013**

Distributed systems are prevalent in computer science and biology. Both domains rely on networks of interacting entities to reach joint decisions, coordinate and respond to inputs. Both also share several other attributes including the use of randomization, the ability to successfully handle failures and attacks, and reusing certain components and ideas in multiple processes or algorithms.

These observations, some dating back to the 60s, have inspired the development of several computational methods including neural networks and genetic algorithms. However, until recently little thought has been given to the specific connections between information processing in biology and the field of distributed computing.

In this workshop we intend to focus on these connections. Specifically, our goal is to highlight that thinking computationally about the settings, requirements and goals of information processing in biological networks can both, improve our understanding of the underlying biology and lead to the development of novel computational methods providing solutions to specific distributed computing problems. Topics include but are not limited to:

- Communication models inspired by biological systems
- Coordination in cell fate determination
- Interactions in ant colonies
- The design and usage of networks in the brain

- Adaptability of networks to changing environments
- Robustness of networks to attacks and failures
- Synchronization

While we anticipate a wide range of topics, both from the biological and from the computational point of view, we expect the submitted papers to identify a specific biological system or process and a corresponding computational problem on which they base their work.

Workshop structure: The one day meeting will consist of several invited talks and several contributed talks selected from the submitted abstracts.

SUBMISSIONS

We solicit submissions describing recent results relevant to biological distributed computing. We especially welcome papers describing new insights and / or case studies regarding the relationship between distributed computing and biological systems even if these are not fully formed. Since a major goal of the workshop is to explore new directions and approaches, we especially encourage the submission of ongoing work. Selected contributors would be asked to present, discuss and defend their work at the workshop. Submissions should be in PDF and include title, author information, and a 4-page extended abstract. Please use the following EasyChair submission link: https://www.easychair.org/conferences/?conf=bda20131

Note: The workshop will not include published proceedings. In particular, we welcome submissions of papers describing work that has appeared or is expected to appear in other venues.

IMPORTANT DATES:

- 17 July 2013 – Paper submission deadline
- 11 August 2013 – Decision notifications
- 14 October 2013 – Workshop

INVITED SPEAKERS:

- Uri Alon – Weizmann Institute
- Ziv Bar-Joseph – CMU
- Yuval Emek – ETH Zurich
- Jasmin Fisher – Microsoft Research UK and University of Cambridge
- Ofer Feinerman – Weizmann Institute
- Amos Korman – CNRS and University of Paris Diderot

PROGRAM COMMITTEE:

- Ziv Bar-Joseph – CMU (Co-chair)
- Yuval Emek – ETH Zurich (Co-chair)
- Amos Korman – CNRS and University of Paris Diderot (Co-chair)

- Naomi Leonard – Princeton
- Nancy Lynch – MIT
- Saket Navlakha – CMU
- Roger Wattenhofer – ETH Zurich

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