

International Conference on Morphological Computation ICMC07

March 26-28, 2007

European Center of Living Technology (ECLT), Venice Italy.

MARCH 26

0800: Breakfast

0830-0900: Registration

Session 26-1:

Session Chair: Norman Packard

0900 – 0945: **Invited Talk:** Rolf Pfeifer
Morphological Computation: Basic Concepts

0945 – 1030: **Invited Talk:** Takashi Ikegami
Autonomy and Dynamic Homeostasis

1035-1115: Coffee Break

Session 26-2:

Session Chair: Mark Bedau

1115 – 1200: **Invited Talk:** John Reif
Autonomous Programmable Biomolecular Devices Using Self-Assembled DNA Nanostructures

1200 – 1225: Preliminary Steps toward Artificial Protocell Computation
Barry McMullin Ciaran Kelly Darragh O'Brien George G. Mitchell James Decraene

1225 – 1250: Defining the Blob Primitives on Amorphous Computers
Moise Valvassori, Arab Ali Cherif

1250-1400: Lunch Break

Session 26-3:

Session Chair: Fumiya Iida

1400 – 1445: **Invited Talk:** Satoshi Murata
Models of Self-Replication

1445 – 1510: Organization of Information Flows in the Perception-Action Loop
Daniel Polani

1510 – 1535: Real-time Requirements and Restricted Resources: The Role of the
Computing Substrate in Robots
Soichiro Tsuda, Klaus-Peter Zauner, and Yukio-Pegio Gunji

1535-1615: Coffee Break

Session 26-4:

Session Chair: John Reif

1615 – 1700: **Invited Talk:** John McCaskill
Evolving Self-Assembling Molecular Recognition Systems

1700 – 1725:

Mark Bedau and Norman Packard

1830 - 1930: Reception & Panel Discussion (Moderator: Rolf Pfeifer)

MARCH 27

0800: Breakfast

Session 27-1:

Session Chair: Rolf Pfeifer

0900 – 0945: **Invited Talk:** Jun Tani
Toward "Organic Compositionality": Dynamical Systems Accounts for Cognitive Behaviors

0945 – 1030: **Invited Talk:** Eric Winfree
In vitro synthetic biology: from self-assembly to biochemical circuits

1030-1115: Coffee Break

Session 27-2:

Session Chair: Jun Tani

1115 – 1200: **Invited Talk:** Akio Ishiguro
A Modular Robot That Exhibits Amoeboid Locomotion, Self-assembly, and Self-repair

1200 – 1225: Locomotion of a Tensegrity Robot via Dynamically Coupled Modules
John Rieffel, Ryan James Stuk, Francisco J. Valero-Cuevas and Hod Lipson

1225 – 1250: On Passive Adaptive Mechanism in Passive Dynamic Walking
Koichi Osuka, Masastugu Iribe and Yasuhiro Sugimoto

1250-1400: Lunch Break

Session 27-3:

Session Chair: Akio Ishiguro

1400 – 1445: **Invited Talk:** Rob Shaw
Geometrical constraints, leaky membranes, and the limits of logic

1445 – 1510: Morphological Computation in Behavior Control
Fumiya Iida

1510 – 1535: A quantification of the morphological computations in perception systems
Torbjörn Lundh

1535-1615: Coffee Break

Session 27-4:

Session Chair: Rob Shaw

1615 – 1700: **Invited Talk:** Thomas Knight

1700 – 1800: Poster Session

1830: Social Event

MARCH 28

0800: Breakfast

Session 28-1:

Session Chair: Takashi Ikegami

0900 – 0945: **Invited Talk:** Rodney Douglas

The Design of Self-Constructing and -Repairing Artificial Organisms

0945 – 1010: Evolving Self-Assembling Digital Circuitry: Towards Realistic Models

Rudolf M. Fuchsli, Thomas Maeke, and John S. McCaskill

1010 – 1035: Membrane as an Interface in a Simple Metabolic Cell

Keisuke Suzuki and Takashi Ikegami

1035-1100: Coffee Break

Session 28-2:

1100 – 1230: Final Discussion

Moderator: Norman Packard

1230- Lunch

Posters Presentations

Tribolon - Water Floating Self-Assembling Units

Shuhei Miyashita, Maik Hadorn and Peter Eggenberger Hotz

A Formula for Network Energy that is Minimized from Random to Small-world

Hideaki Suzuki

Discovering a Running Locomotion Strategy through Body and Neural Dynamics

Simon Bovet, Fumiya Iida

Robotic Self-Assembly and Self-Repair

Daniel J. Arbuckle, Aristides A. G. Requicha

Embodiment, structural coupling and morphological computation: let us not stop halfway

Matěj Hoffmann

Towards Crowd-Controlled Evolutionary Design and Lamarckian Evolution of Shapes

Martin Schneider

On the Information Metrics Of Controlled Dynamical Systems

Fabio P. Bonsignorio

Policy Selection Based on Robot's Embodiment from Multiple Human Teachings

Masato Kotake, Daisuke Katagami, Katsumi Nitta

Virtuality in neural dynamical systems

Francesco Donnarumma, Roberto Prevete, Giuseppe Trautteur

A Functional Model of Development and Expression in an Artificial Organism

Alessandro Fontana

Defining the Blob Primitives on Amorphous Computers

Moise Valvassori, Arab Ali Cherif

The Lagging Legs: Exploiting Body Dynamics to Steer a Quadrupedal Agent

Mike Rinderknecht, Jonas Ruesch and Maik Hadorn

Experience in the Real World for Incremental Individual Recognition

Lijin Aryananda

On the Robustness of Simple Speed Control for a Quadruped Robot

Alexander Schmitz, Gabriel Gomez, Fumiya Iida and Rolf Pfeifer