The Fifteenth International Conference on the Synthesis and Simulation of Living Systems

ALIFEXV

Cancun, Mexico, July 4th-8th 2016.

Organizing committee

Carlos Gershenson
General Co-Chair

Tom Froese
General Co-Chair

J. Mario Siqueiros-García
Program Chair

Wendy Aguilar
Communications Chair

Iliana Mendoza
Art Chair

Eduardo Izquierdo
Workshop Chair

Hiroki Sayama
ISAL Representative

Gerardo Betancourt
Local Organization

Marimar Gargari
Local Organization

General program information

Registration and information desk will be open from 8:00 to 18:30

Lunch time is at 13:00, free buffet lunch for conference attendees.

Extra tickets for lunch and social events can be purchased at the information desk.

Speakers are expected to be present in the room before the beginning of their session to test their presentation.

Talks last 25 minutes plus 5 minutes for questions.

For the ALife & Society session talks will last 15 minutes plus 5 minutes for questions.

Art program

From Monday to Friday

Isla Mujeres 1 & 2
9:00-18:30 Ken Rinaldo Art Exhibit

Isla Mujeres 3
9:00-18:30 Tatsuo Unemi and Daniel Bisig Art Exhibit

From Monday to Tuesday

Main hall
9:00-18:30 Mario García-Valdez Art Exhibit

Isla Mujeres 4
9:00-18:30 Tatsuo Unemi

From Tuesday to Friday

Main hall
9:00-18:30 Ken Rinaldo Video art Exhibit
9:00-18:30 Amy M. Young Video art Exhibit
9:00-18:30 TradeMark Gunderson Video art Exhibit

Wednesday & Friday

Isla Mujeres 4
9:00-18:30 Eduardo Makoszay Mayén Art Exhibit

Schedule: Monday 4 July

	Cobá	Isla Mujeres 1 & 2	Isla Mujeres 3	Isla Mujeres 4	Main hall	Xcaret 1	Xcaret 2	Tulum 1	Tulum 2	Tulum 3	Tulum 4
8:00	Registration										
9:00	OEE	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Tatsuo Unemi	Mario García-Valdez:	Tutorial AVIDA-Ed	Workshop MEW		Workshop EGT	Workshop BFE	Tutorial NetLogo
10:45	Coffee break										
11:15	OEE	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Tatsuo Unemi	Mario García-Valdez:	Tutorial AVIDA-Ed	Workshop MEW		Workshop EGT	Workshop BFE	Tutorial NetLogo
13:00	Lunch break										
14:30	OEE	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Tatsuo Unemi	Mario García-Valdez:	Tutorial AEVOL	Workshop SLCS	Tutorial ISA	Workshop SLACE	Workshop BFE	Tutorial MABE
16:15	Coffee break										
16:45	OEE	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Tatsuo Unemi	Mario García-Valdez:	Tutorial AEVOL	Workshop SLCS	Tutorial ISA	Workshop SLACE	Workshop BFE	Tutorial MABE
18:30	Opening speeches, keynote presentation by Ken Rinaldo, and welcome cocktail										

Schedule: Tuesday 5 July

	Cobá	Isla Mujeres 1 & 2	Isla Mujeres 3	Isla Mujeres 4	Main hall	Xcaret 3 & 4	Contoy
8:00	Registration						
9:00	**Keynote** Ezequiel Di Paolo	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Tatsuo Unemi	Ken Rinaldo; Mario García-Valdez Amy M. Young; TradeMark Gunderson Video art Exhibit		
10:00	Video posters						
10:30	Coffee break and poster session						
11:10	Computational Biology	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Tatsuo Unemi	Ken Rinaldo; Mario García-Valdez;Amy M. Young; TradeMark Gunderson Video art Exhibit	Workshop GSO	ISAL Board meeting
13:00	Lunch break and poster session						
14:30	**Keynote** Alexandra Penn	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Tatsuo Unemi	Ken Rinaldo; Mario García-Valdez; Amy M. Young; TradeMark Gunderson Video art Exhibit		
15:30	Coffee break and poster session						
16:00	**ISAL Special Session:** Alife & Society (ends at 19:00)	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Tatsuo Unemi	Ken Rinaldo; Mario García-Valdez;Amy M. Young; TradeMark Gunderson Video art Exhibit	Workshop GSO	Workshop SCBCS
18:30	Performance Art by Eduardo Makoszay https://vimeo.com/161073651						

Schedule: Wednesday 6 July

	Cobá	Isla Mujeres 1 & 2	Isla Mujeres 3	Isla Mujeres 4	Main hall	Xcaret 1 & 2	Xcaret 3 & 4
8:00	Registration						
9:00	**Keynote** Jorge Pacheco	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit	Ken Rinaldo; Amy M. Young; TradeMark Gunderson Video art Exhibit		
10:00	Coffee break and poster session						
10:30	Morphology	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit	Ken Rinaldo; Amy M. Young; TradeMark Gunderson Video art Exhibit	Human-Computer interaction	**ISAL Summer School** **René Doursat:** *Welcome and introduction*
10:35							**ISAL Summer School** **Mark Bedau:** *How complexity drives ALife's philosophical foundations and its scientific challenges and opportunities*
11:50							**ISAL Summer School** **Carlos Gershenson:** *Engineering and controlling self-organizing systems*
13:00	Lunch break and poster session						
14:30	**Keynote** Mark Bickhard	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit	Ken Rinaldo; Amy M. Young; TradeMark Gunderson Video art Exhibit		
15:30	Coffee break and poster session						
16:00	Computational Biology	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit	Ken Rinaldo; Amy M. Young; TradeMark Gunderson Video art Exhibit	Collective behavior, Artificial Societies and Culture	**ISAL Summer School** **Alexandra Penn:** *Steering complex human systems*
17:15							**ISAL Summer School** **Mikhail Prokopenko:** *Information dynamics in complex systems*
18:30	Conference banquet during the evening						

Schedule: Thursday 7 July

	Cobá	Isla Mujeres 1 & 2	Isla Mujeres 3	Isla Mujeres 4	Main hall	Xcaret 1 & 2	Xcaret 3 & 4
8:00	Registration						
9:00	**Keynote** Randall R. Beer	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit	Ken Rinaldo; Amy M. Young; TradeMark Gunderson Video art Exhibit		
10:00	Coffee break and poster session						
10:30	Development	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit	Ken Rinaldo; Amy M. Young; TradeMark Gunderson Video art Exhibit	Theory and measures	Open-ended evolution and Evolvavility
13:00	Lunch break and poster session						
14:30	**Keynote** Francisco Santos	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit	Ken Rinaldo; Amy M. Young; TradeMark Gunderson Video art Exhibit		
15:30	Coffee break and poster session						
16:00	Origins of Life, Protocells, and Genetics	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit	Ken Rinaldo; Amy M. Young; TradeMark Gunderson Video art Exhibit	Collective behavior, Artificial Societies and Culture	Living technology and Human-Computer interaction
18:30	Oraculum, Oscillations of Earth by Antonio Isaac Gómez (Performance Art) & Farewell dinner						

Schedule: Friday 8 July

	Cobá	Isla Mujeres 1 & 2	Isla Mujeres 3	Isla Mujeres 4	Main hall	Xcaret 1 & 2
8:00	Registration					
9:00	**Keynote** Linda Smith	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit	Ken Rinaldo; Amy M. Young; TradeMark Gunderson Video art Exhibit	
10:00	Coffee break					
10:30	Self-optimization, automation, learning and memory	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit		Artificial Chemistries
13:00	Lunch break					
14:30	**Keynote** Katie Bentley	Ken Rinaldo Art Exhibit	Tatsuo Unemi and Daniel Bisig Art Exhibit	Eduardo Makoszay Mayén Art Exhibit	Ken Rinaldo; Amy M. Young; TradeMark Gunderson Video art Exhibit	
15:30	**Cobá** **Conference final session** * Plans for Future Conferences * Society Updates * Results of ALife and Society Brainstorming * Discussion about ALife Community Growth * Conference Awards * ISAL Society Awards					

Monday 4 July

Monday 4 July 9:00

Cobá

9:00-10:45 *OEE: Open Ended Evolution: Recent Progress* (Organizers: Mark Bedau, Alastair Channon, and Tim Taylor).

10:45-11:15 Coffee break

11:15-13:00 *OEE: Open Ended Evolution: Recent Progress* (Organizers: Mark Bedau, Alastair Channon, and Tim Taylor).

13:00-14:30 Lunch break

14:30-16:15 *OEE: Open Ended Evolution: Recent Progress* (Organizers: Mark Bedau, Alastair Channon, and Tim Taylor).

16:15-16:45 Coffee break

16:45-18:30 *OEE: Open Ended Evolution: Recent Progress* (Organizers: Mark Bedau, Alastair Channon, and Tim Taylor).

Xcaret 1

9:00-10:45 *AVIDA-Ed: Avida-ED, a tool for teaching a classroom research.*

10:45-11:15 Coffee break

11:15-13:00 *AVIDA-Ed: Avida-ED, a tool for teaching a classroom research.*

13:00-14:30 Lunch break

14:30-16:15 *AEVOL: In silico experimental evolution with the Aevol Software.*

16:15-16:45 Coffee break

16:45-18:30 *AEVOL: In silico experimental evolution with the Aevol Software.*

Xcaret 2

9:00-10:45 *MEW: Morphogenetic Engineering Workshop* (Organizers: René Doursat and Hiroki Sayama).

10:45-11:15 Coffee break

11:15-13:00 *MEW: Morphogenetic Engineering Workshop* (Organizers: René Doursat and Hiroki Sayama).

13:00-14:30 Lunch break

14:30-16:15 *SLCS: Steering Living and Life-like Complex Systems* (Organizers: Alexandra Penn, Rob Mills, and Emma Hart).

16:15-16:45 Coffee break

16:45-18:30 *SLCS: Steering Living and Life-like Complex Systems* (Organizers: Alexandra Penn, Rob Mills, and Emma Hart).

Tulum 1

14:30-16:15 *ISA: Introductory Statistics for ALife Experiments: A Visual Approach.*

16:15-16:45 Coffee break

16:45-18:30 *ISA: Introductory Statistics for ALife Experiments: A Visual Approach.*

Tulum 2

9:00-10:45 *EGT: Multidisciplinary applications of evolutionary game theory* (Organizers: Tom Lenaerts, Luis A. Martínez-Vaquero, Jelena Grujic, Francisco C. Santos, and Tom Froese).

10:45-11:15 Coffee break

11:15-13:00 *EGT: Multidisciplinary applications of evolutionary game theory* (Organizers: Tom Lenaerts, Luis A. Martínez-Vaquero, Jelena Grujic, Francisco C. Santos, and Tom Froese).

13:00-14:30 Lunch break

14:00-16:15 S*LACE: Social Learning and Cultural Evolution* (Organizers: Chris Marriot, Peter Andras, James Borg, and Paulo Smaldino).

16:15-16:45 Coffee break

16:45-18:30 S*LACE: Social Learning and Cultural Evolution* (Organizers: Chris Marriot, Peter Andras, James Borg, and Paulo Smaldino).

Tulum 3

9:00-10:45 *BFE: The Biological Foundations of Enactivism* (Organizers: Eran Agmon, Nathaniel Virgo, Tom Froese, and Matthew Egbert).

10:45-11:15 Coffee break

11:15-13:00 *BFE: The Biological Foundations of Enactivism* (Organizers: Eran Agmon, Nathaniel Virgo, Tom Froese, and Matthew Egbert).

13:00-14:30 Lunch break

14:30-16:15 *BFE: The Biological Foundations of Enactivism* (Organizers: Eran Agmon, Nathaniel Virgo, Tom Froese, and Matthew Egbert).

16:15-16:45 Coffee break

16:45-18:30 *BFE: The Biological Foundations of Enactivism* (Organizers: Eran Agmon, Nathaniel Virgo, Tom Froese, and Matthew Egbert).

Tulum 4

9:00-10:45 *NetLogo: A low threshold/high ceiling for programming multi-agent models.*

10:45-11:15 Coffee break

11:15-13:00 *NetLogo: A low threshold/high ceiling for programming multi-agent models.*

13:00-14:30 Lunch break

14:30-16:15 *MABE: An Introduction to MABE (Modular Agent Based Evolution) and Markov Network Brains.*

16:15-16:45 Coffee break

16:45-18:30 *MABE: An Introduction to MABE (Modular Agent Based Evolution) and Markov Network Brains.*

Monday 4 July 18:30

Opening speeches:

Organizers

Héctor Benítez (IIMAS Director)

Keynote: Ken Rinaldo: *In symbio biopoiesis as model of evolved Alife (Abiopoiesis Microbiome)*

Opening reception and welcome cocktail

Tuesday 5 July

Tuesday 5 July 9:00

Cobá

Keynote: Ezequiel DiPaolo: *Gilbert Simondon and the enactive conception of life and mind*

Tuesday 5 July 10:00

Cobá

10:30-11:05 Video poster session

Tuesday 5 July 10:30

10:00-10-30 Coffee break and poster session

Tuesday 5 July 10:30

Contoy

10:30-13:00 ISAL Board meeting

Tuesday 5 July 11:10

Cobá/Computational Biology

Chair: *Inman Harvey*

11:10 *Eukaryo: An Agent-based, Interactive Simulation of a Eukaryotic Cell*. Douglas Yuen and Christian Jacob

11:40 *Flies as Ship Captains? Digital Evolution Unravels Selective Pressures to Avoid Collision in* Drosophila. Ali Tehrani-Saleh, Christoph Adami and Randal Olson

12:10 *The Effects of Evolution and Spatial Structure on Diversity in Biological Reserves*. Emily Dolson, Michael Wiser and Charles Ofria

12:40 *Social Systems and Ecosystems: History Matters*. Inman Harvey

Tuesday 5 July 11:10

Xcaret 3 & 4

11:10-13:00 *GSO: Eight International Workshop on Guided Self-Organization* (Organizers: Mikhail Prokopenko, Carlos Gershenson, and Daniel Polani).

Tuesday 5 July 13:00

13:00-14:30 Lunch break and poster session

Tuesday 5 July 14:30

Cobá

Keynote: Alexandra Penn: *Artificial Life and Society: Philosophies and Tools for Experiencing, Interacting with and Managing Real World Complex Adaptive Systems*

Tuesday 5 July 15:30

15:30-16:00 Coffee break and poster session

Tuesday 5 July 16:00

Cobá/ISAL Special Session: ALife & Society

Chair: *Alexandra Penn*

16:00 *Artificial Life meets Real Death playfully: Complex socio-ecological games with and for the rural poor*. Luis García Barrios

16:20 *Human Crowd Simulation: What Can We Learn From Alife?* Rui Filipe Antunes and Nadia Magnenat-Thalmann

16:40 *ALife as a Model Discipline for Policy-Relevant Simulation Modelling: Might "Worse" Simulations Fuel a Better Science-Policy Interface?* Seth Bullock

17:00 *The institutional approach for modeling the evolution of human societies*. Simon Powers

17:20 *The BINC Manifesto: Technology driven societal changes, science policy & stakeholder engagement*. Steen Rasmussen

17:40 *The Carried Network Demarc*. David Ackley

18:00 *The systemic complexity of the social and ethical debate about artificial life*. Mark Bedau

18:20-18:50 Group Discussion and Agenda-Setting Session: Grand Challenges for Societal Impact of Artificial Life

18:50-19:00 Formation of action groups: Taking practical proposals forward

Tuesday 5 July 16:00

Xcaret 3 & 4

16:00-18:30 *GSO: Eight International Workshop on Guided Self-Organization* (Organizers: Mikhail Prokopenko, Carlos Gershenson, and Daniel Polani).

Tuesday 5 July 16:00

Contoy

16:00-18-30 *SCBCS: Synthesizing Concepts from Biology and Computer Science* (Organizers: Emily Dolson and Charles Ofria).

Tuesday 5 July 18:30

18:30 Performance Art by Eduardo Makoszay https://vimeo.com/161073651
Social event TBC

Wednesday 6 July

Wednesday 6 July 9:00

Cobá

Keynote: Jorge Pacheco: *Linking Individual to Collective Behavior in Complex Adaptive Networks*

Wednesday 6 July 10:00

10:00-10:30 Coffee break and poster session

Wednesday 6 July 10:30

Cobá/Morphology

Chair: *Tim Taylor*

10:30 *On the Difficulty of Co-Optimizing Morphology and Control in Evolved Virtual Creatures*. Nicholas Cheney, Josh Bongard, Vytas Sunspiral and Hod Lipson

11:00 *Material properties affect evolution's ability to exploit morphological computation in growing soft-bodied creatures*. Francesco Corucci, Nick Cheney, Hod Lipson, Cecilia Laschi and Josh Bongard

11:30 *Shape matters in cooperation*. Dusan Misevic, Antoine Frenoy, Ariel B. Lindner and François Taddei

12:00 *Evolution-in-Materio of a dynamical system with dynamical structures*. Odd Rune Lykkebø and Gunnart Tufte

12:30 *Exploring the coevolution of predator and prey morphology and behavio*r. Randal Olson, Arend Hintze, Fred Dyer, Jason Moore and Christoph Adami

Wednesday 6 July 10:30

Xcaret 1 & 2/Human-Computer interaction

10:30 *A Telepresence-Robot Approach for Efficient Coordination of Swarms*. Karl Tuyls, Sjriek Alers, Elisa Cucco, Daniel Claes and Daan Bloembergen

11:00 *Generating Artificial Plant Morphologies for Function and Aesthetics through Evolving L-Systems*. Frank Veenstra, Andres Faina, Kasper Stoy and Sebastian Risi

11:30 *Robots can ground crowd-proposed symbols by forming theories of group mind*. Joey Anetsberger and Josh Bongard

12:00 *Social Contribution in the Design of Adaptive Machines on the Web*. Mark Wagy and Josh Bongard

Wednesday 6 July 10:30

Xcaret 3 & 4

10:30-13:00 ISAL Summer School (Organizer: René Doursat)

10:30-10-35 *Welcome and introduction*
René Doursat

10:35-11:50 *How complexity drives ALife's philosophical foundations and its scientific challenges and opportunities*
Mark Bedau

11:50-13:05 *Engineering and controlling self-organizing systems*
Carlos Gershenson

Wednesday 6 July 13:00

13:00-14:30 Lunch break and poster session

Wednesday 6 July 14:30

Cobá

Keynote: Mark Bickhard *Cognition and the Brain*

Wednesday 6 July 15:30

15:30-16:00 Coffee break and poster session

Wednesday 6 July 16:00

Cobá/Computational Biology

Chair: *Josh Bongard*

16:00 *"Shit Happens": The Spontaneous Self-Organisation of Communal Boundary Latrines via Stigmergy in a Null Model of the European Badger,* Meles meles. Seth Bullock

16:30 *A Level Set Approach to Simulating* Xenopus laevis *Tail Regeneration*. Zachary Serlin, Jason Rife and Michael Levin

17:00 *Propagation of rhythmic dorsoventral wave in a neuromechanical model of locomotion in* Caernohabditis elegans. Eduardo J. Izquierdo and Randall D. Beer

17:30 *A 3D Multiscale Model of Chemotaxis in Bacteria*. Andrew Wu and Christian Jacob

18:00 *In Silico Experimental Evolution suggests a complex intertwining of selection, robustness and drift in the evolution of genetic networks complexity.* Yoram Vadée Le Brun, Guillaume Beslon and Jonathan Rouzaud-Cornabas

Wednesday 6 July 16:00

Xcaret 1 & 2/Collective behavior, Artificial Societies and Culture

16:00 *FireSlime Algorithm: Bio-Inspired Emergent Gradient Taxis*. Joshua Cherian Varughese, Ronald Thenius, Franz Wotawa and Thomas Schmickl

16:30 *Task Allocation in Foraging Robot Swarms: The Role of Information Sharing.* Lenka Pitonakova, Richard Crowder and Seth Bullock

17:00 *Performance Metrics of Collective Coordinated Motion in Flocks*. Jorge L. Zapotecatl, Angélica Muñoz-Meléndez and Carlos Gershenson

17:30 *Cooperation and Reputation in Primitive Societies*. Fernando P. Santos, Francisco C. Santos and Jorge M. Pacheco

18:00 *Divergent Cumulative Cultural Evolution.* Chris Marriott and Jobran Chebib

Wednesday 6 July 16:00

Xcaret 3 & 4

16:00-18-30 ISAL Summer School (Organizer: René Doursat)

16:00-17:15 *Steering complex human systems*
Alexandra Penn (University of Surrey, UK)

17:15 – 18:30 *Information dynamics in complex systems*
Mikhail Prokopenko (The University of Sydney, Australia)

Wednesday 6 July 18:30

Conference banquet during the evening

Thursday 7 July

Thursday 7 July 9:00

Cobá

Keynote: Randall R. Beer: *Autopoiesis and Enaction in the Game of Life*

Thursday 7 July 10:00

10:00-10:30 Coffee break and poster session

Thursday 7 July 10:30

Cobá/Development

Chair: *Linda Smith*

10:30 *Developmental encodings promote the emergence of hierarchical modularity*. Jessica Lowell and Jordan Pollack

11:00 *Dynamic Structure Discovery and Repair for 3D Cell Assemblages*. Giordano Ferreira, Max Smiley, Matthias Scheutz and Michael Levin

11:30 *Evolved Developmental Strategies of Artificial Multicellular Organisms*. Jean Disset, Sylvain Cussat-Blanc and Yves Duthen

12:00 *Bio-Reflective Architectures for Evolutionary Innovation*. Simon Hickinbotham and Susan Stepney

12:30 *Evolving Specialisation in a Population of Heterogeneous Robots: the Challenge of Bootstrapping and Maintaining Genotypic Polymorphism*. Arthur Bernard, Jean-Baptiste André and Nicolas Bredeche

Thursday 7 July 10:30

Xcaret 1 & 2/Theory and measures

Chair: *Christoph Salge*

10:30 *Nonequilibrium thermodynamic stability: the apparent teleology of living beings*. Mario Villalobos

11:00 *Does Empowerment Maximisation Allow for Enactive Artificial Agents?* Christian Guckelsberger and Christoph Salge

11:30 *Quantifying Viability*. Matthew Egbert and Juan Pérez-Mercader

12:00 *Towards information based spatiotemporal patterns as a foundation for agent representation in dynamical systems*. Martin Biehl, Takashi Ikegami and Daniel Polani

Thursday 7 July 10:30

Xcaret 3 & 4/Open-ended evolution and Evolvavility

Chair: *Mark Bedau*

10:30 *The Evolutionary Origins of Phenotypic Plasticity*. Alexander Lalejini and Charles Ofria

11:00 *The Limits of Decidable States on Open Ended Evolution and Emergence*. Santiago Hernández-Orozco, Francisco Hernández-Quiroz and Hector Zenil

11:30 *How the Strictness of the Minimal Criterion Impacts Open-Ended Evolution*. L. B. Soros, Nick Cheney and Kenneth O. Stanley

12:00 *The Evolution of Evolvability: Changing Environments Promote Rapid Adaptation in Digital Organisms.* Rosangela Canino-Koning, Michael J. Wiser and Charles Ofria

12:30 *The Relationship Between Evolvability and Robustness in the Evolution of Logic Networks*. David Shorten and Geoff Nitschke

Thursday 7 July 13:00

13:00-14:30 Lunch break and poster session

Thursday 7 July 14:30

Cobá

Keynote: Francisco Santos: *Climate Change Governance, Cooperation and Self-organization*

Tuesday 5 July 15:30

15:30-16:00 Coffee break and poster session

Thursday 7 July 16:00

Cobá/Origins of Life, Protocells, and Genetics

Chair: *Takashi Ikegami*

16:00 *Digital Replicators Emerge from a Self-Organizing Prebiotic World*. Andrew Pargellis and Benjamin Greenbaum

16:30 *Exploring Constraint: Simulating Self-Organization and Autogenesis in the Autogenic Automaton.* Stefan Leijnen, Tom Heskes and Terrence Deacon

17:00 *Protein synthesis with liposome fusion and fission by using the freeze-thaw method*. Gakushi Tsuji, Takeshi Sunami, Satoshi Fujii and Tetsuya Yomo

17:30 *Critical Mutation Rate has an Exponential Dependence on Population Size for Eukaryotic-Length Genomes*. Elizabeth Aston, Alastair Channon, Roman Belavkin, Rok Krasovec and Christopher Knight

18:00 *Reductive evolution towards primitive life: What will we see?* Atsushi Shibai, Daisuke Motooka, Shota Nakamura and Saburo Tsuru

Thursday 7 July 16:00

Xcaret 1 & 2/Collective behavior, Artificial Societies and Culture

Chair: *Seth Bullock*

16:00 *Understanding Language Evolution in Overlapping Generations of Reinforcement Learning Agents*. Lewys Brace and Seth Bullock

16:30 *Population Based Simulation of Gender Inequality Issues*. John Bullinaria

17:00 *Cultural wave front expansion explains multiple stages of diversity during the Neolithic Transition in Europe*. Cornelis Drost and Marc Vander Linden

17:30 *Job Insecurity in Academic Research Employment: An Agent-Based Model*. Eric Silverman, Nic Geard and Ian Wood

18:00 *Increasing Reward in Biased Natural Selection Decreases Task Performance*. Evert Haasdijk and Floor Eigenhuis

Thursday 7 July 16:00

Xcaret 3 & 4/Living technology and Human-Computer interaction

Chair: *Christian Guckelsberger*

16:00 *EvoBot: An Open-Source, Modular Liquid Handling Robot for Nurturing Microbial Fuel Cells*. Andres Faina, Farzad Nejatimoharrami, Kasper Stoy, Pavlina Theodosiou, Benjamin Taylor and Ioannis Ieropoulos

16:30 *Robotic Automation to Augment Quality of Artificial Chemical Life Experiments*. Farzad Nejatimoharrami, Andres Faina, Jitka Čejková, Martin Hanczyc and Kasper Stoy

17:00 *A Bio-Inspired Artificial Agent to Complete a Herding Task with Novices*. Patrick Nalepka, Maurice Lamb, Rachel W. Kallen, Kevin Shockley, Anthony Chemero and Michael J. Richardson

17:30 *Small Bugs, Big Ideas: Teaching Complex Systems Principles Through Agent-Based Models of Social Insects*. Yu Guo and Uri Wilensky

Thursday 7 July 18:30

18:30 Oraculum, Oscillations of Earth by Antonio Isaac Gómez (Performance Art)

Farewell dinner

Friday 8 July

Friday 8 July 9:00

Cobá

Keynote: Linda Smith: *Why development matters to (artificial) life: Lessons from human babies*

Friday 8 July 10:00

10:00-10:30 Coffee break

Friday 8 July 10:30

Cobá/Self-optimization, automation, learning and memory

Chair: *Julien Hubert*

10:30 *Expansion of Perception Area in Cellular Automata Using Recursive Algorithm*. Yoshihiko Kayama

11:00 *Fully Autonomous Real-Time Autoencoder-Augmented Hebbian Learning through the Collection of Novel Experiences*. Joshua Bowren, Justin Pugh and Kenneth Stanley

11:30 *Body Representations for Robot Ego-Noise Modelling and Prediction. Towards the Development of a Sense of Agency in Artificial Agents*. Guido Schillaci, Claas-Norman Ritter, Verena Vanessa Hafner and Bruno Lara

12:00 *How Complexity Pervades Specialization in Canonical Embodied Evolution*. Pedro Trueba, Abraham Prieto, Francisco Bellas and Richard J. Duro

12:30 *Functional Modularity Enables the Realization of Smooth and Effective Behavior Integration*. Jônata Tyska Carvalho and Stefano Nolfi

Friday 8 July 10:30

Xcaret 1 & 2/Artificial Chemistries

Chair: *Olaf Witkoswki*

10:30 *A Self-Replicating System of Ribosome and Replisome Factories*. Lance Williams

11:00 *Generalized Stochastic Simulation Algorithm for Artificial Chemistry*. Hedi Soula

11:30 *Thresholds in Messy Chemistries*. Nathaniel Virgo

12:00 *A Precarious Existence: Thermal Homeostasis of Simple Dissipative Structures*. Stuart Bartlett and Seth Bullock

12:30 *Jordan Algebra AChems: Exploiting Mathematical Richness for Open Ended Design*. Penelope Faulkner, Angelika Sebald and Susan Stepney

Friday 8 July 14:30

Cobá

Keynote: Katie Bentley: *Do Endothelial Cells Dream of Eclectic Shape?*

Friday 8 July 15:30

Cobá

15:30-17:30 **Conference final session**

* Plans for Future Conferences
* Society Updates
* Results of ALife and Society Brainstorming
* Discussion about ALife Community Growth
* Conference Awards
* ISAL Society Awards

Posters

Living technology

1 **Kazunari Ozasa, June Won, Simon Song and Mizuo Maeda**
Artificial Interaction between Two Isolated Micro-Algae Populations for Autonomous Pattern and Rhythm Formation

2 **Israel Tabarez-Paz, Isaac Rudomin and Hugo Pérez**
Support Vector Machine and spiking neural networks for for data driven prediction of crowd character movement

Artificial Societies

3 **Roberto Ulloa and Tom Froese**
Nobility-targeting raids among the Classic Maya: Cooperation in scale-free networks persists under tournament attack when population size fluctuates

4 **Kazuaki Kojima, Reiji Suzuki and Takaya Arita**
Equality seekers or timid monopolists: Social structure affects the evolution of distributive norms

5 **Martin Cenek and Spencer Dahl**
Towards Emergent Design: Analysis, Fitness and Heterogeneity of Agent Based Models Using Geometry of Behavioral Spaces Framework.

Cooperation and Collective Behavior

6 **Peter Andras**
Social Learning, Environmental Adversity and the Evolution of Cooperation

7 **Chris Marriott and Jobran Chebib**
Finding a Mate with Eusocial Skills

8 **Fuki Ueno and Takaya Arita**
Small-world property promotes the evolution of distributive altruism

Learning and Memory

9 **Peter Bentley, Alexander Kurashov and Soo Ling Lim**
Higher Order Cognition using Computers: Learning Abstract Concepts with Recursive Graph- based Self Organizing Maps

10 **Julien Hubert and Takashi Ikegami**
How long did it last? Memorizing interval timings in a simple robotic task

11 **Mikaela Leas, Emily Dolson, Riley Annis, Joshua Nahum, Laura Grabowski and Charles Ofria**
The Prisoner's Dilemma, Memory, and the Early Evolution of Intelligence

Computational Biology

12 **Héctor Sánchez, Edgar Vallejo and Charles Taylor**
PajaroLoco: A suite of programs to study complex adaptive properties of animal language. An example of Cassin's vireo syntax network.

13 **Neil Vaughan**
Visual Navigation in Simulated Pigeons

Development

Human-Computer interaction

Self-Optimization and Automation

Origins of Life and Protocells

Late Break Abstracts Posters

40 **Jitka Cejkova, Dominik Svara, Martin M.** Hanczyc and Frantisek Stepanek
Shape changing multi-armed droplets

41 **Oliver López-Corona and Pablo Padilla**
The emergence of cooperation from entropic principles and sustainability

42 **Elvia Ramírez-Carrillo, Oliver López Corona, Fernando de León-González, Gilberto Vela Correa and Alejandro Frank**
Soil Respiration as a Proxy for Ecosystem Health

43 **Changduk Yang**
Polydiacetylene-based biosensor for colorimetric detection of clinical DNA

44 **Hye Jin Cho, Kyu Cheol Lee and Changduk Yang**
PVDF-g-PtBA Copolymers for Triboelectric Nanogenerators with High Dielectric Constant

45 **Francesco Corucci, Nicholas Cheney, Hod Lipson, Cecilia Laschi and Josh Bongard**
Evolving swimming soft-bodied creatures information

46 **Hiroki Sayama, Ali Jazayeri and J. Scott Turner**
A Finite State Machine-Based Approach for Detecting Interactions among Individuals with Different States in a Biological Collective

47 **Maitri Mangal, Graham Wilcox, Haashim Shah, Hiroki Sayama and Carol Reynolds**
How Old Should You Be To Become a Father? Reconstructing the Fitness Function over Paternal Age

48 **Chiara Picchi, Fabrizio Cinelli, Rodrigo Rubio and Francesco Corucci**
Artificial Life inspired Architecture: a sustainable and adaptive treehouses ecosystem in the Chilean forest

49 **Erick Pérez and Tom Froese**
A network model of the appearance of biologically irresolvable conflict in prehistoric hunter-gatherer groups

50 **Matthew Dale, Julian Miller, Susan Stepney and Martin Trefzer**
Modelling and Training Unconventional in-Materio Computers using Bio-Inspired Techniques

51 **Yuliya Betkher, Vitor Santos and Nuno Nabais**
Impact of ALife Simulation of Darwin's and Lamarck’s Theories of Evolution on Life and Society

52 **Rob Mills, Martina Szopek, Michael Bodi, Thomas Schmickl and Luís Correia**
On the timescale of interactions in bio-hybrid systems

53 **Reiji Suzuki**
Complex systems approach to temporal soundscape partitioning in bird communities

54 **Marco Montalva Medel, Fabiola Lobos, Thomas Ledger and Eric Goles**
Expanding the limits of bistability modelling: a Boolean-based continuous representation of the lac operon regulation dynamics

55 **Nathanael Aubert-Kato, Olaf Witkowski, Erik Hoel and Nicolas Bredeche**
Agency in Messy Chemistries: Information-Theoretic Measures vs. Strategies Case Study in a Reaction-Diffusion Model

Floor plan


SALÓN TULUM
SALÓN COZUMEL
RECEPCIÓN
TERRAZA
AKUMAL
SALÓN
ISLA MUJERES
SALÓN XCARET
VESTIBULO
SALÓN COBÁ