



## Complex Systems approaches for Molecular Robotics (CSMR2019)

Izunagaoka, Japan

May 25–26, 2019

### Program

#### Day 1

11:15 am Pick up from the hotel Izunagaoka station

12:30 pm Opening

#### **Session 1: Evolutionary optimization**

12:35 pm – 1:10 pm L. Cazenille, Exploring self-aggregation in swarms of bio-micro-robots using Quality-Diversity algorithms

1:10 pm – 1:35 pm Y. Sakanaka, The improvement of artificial immune algorithm Opt-IA through surrogate assistant model

1:35 pm – 2:10 pm N. Aubert-Kato, Algorithmic search for structural complexity in DNA-only hybridization networks

2:10 pm – 2:35 pm E. Morikawa, Optimizing Molecular-based Reservoir Computers with NSGA-II

2:35 pm – 3:00 pm H. Sellami, GPU computing for training deep biochemical networks

3:00 pm – 3:30 pm Break (+ check-in)

#### **Session 2: Modeling and emergence**

3:30 pm – 4:05 pm O. Witkowski, Open-ended swarm intelligence

4:05 pm – 4:40 pm S. Inagaki, Analysis of synchronization in oscillators using a band-pass filter

4:40 pm – 5:05 pm E. Yamazaki, Using Variational AutoEncoders for classifying molecular reaction networks

5:05 pm – 5:40 pm N. Lobato-Dauzier, Ecology in biomolecular systems, towards a synthetic ecology

5:40 pm – 6:00 pm Free discussion

Day 1 end: 6:00 pm; Followed by: dinner, free time

#### Day 2

\*\*before 10 am: check out\*\*

#### **Session 3: In-vitro approaches**

9:30 am – 9:55 am P. Orhan, Creating neural network with biochemical reactions

9:55 am – 10:30 am A. Genot, Hearing the shape of a reactor with deep reaction diffusion networks

10:30 am – 10:55 am R. Deteix, Study of temperature-controlled biochemical reaction networks in droplets

10:55 am – 11:30 am A. Baccouche, From molecular programs to cellular cyborgs

11:30 am – 12:00 am free discussion; closing

Day 2 end: 12:00 pm; Followed by: lunch, free discussion and self organization

# Venue

小松屋八の坊

1056-1 Nagaoka, Izunokuni, Shizuoka

Access:

