ICCN 2019 Scientific Program

The 7th International Conference on Cognitive Neurodynamics 2019

Alghero, Italy
September 29 - October 2, 2019

How to get to ICCN 2019

ICCN 2019 is held in the Dipartimento di Architettura, Design e Urbanistica, Università degli Studi di Sassari, Alghero, Sardinia, Italy.
Address:
Bastioni Marco Polo 77, 07041 Alghero (SS), Italy

Directions

NOTE: The instructions below are just indicative! For any transportation option, make sure to double check the timetable a few weeks before your trip.

By air
- Landing in Alghero airport. The airport in Alghero offers mostly domestic destinations and some international destinations during the summer season. It is located around 10km from downtown.
- Landing in Olbia airport. The Olbia airport lies about 140km away from Alghero. It serves domestic and international destinations. The easiest way to get to ICCN 2019 from this airport is the direct coach service Olbia-Alghero (2.5 hours, 20 EUR).
- Landing in Elmas (Cagliari) airport. This is the main airport on the island, serving several international destinations. It lies further away from ICCN 2019, you should count around 5 hours travel time. You can reach Alghero by train, with a connection in Sassari. It is a good option if you plan to spend a few extra days before or after the conference to explore the beautiful island of Sardinia.

Another option is to rent a car at the airport and drive to Alghero. Most hotels in Alghero offer parking to their guests.

By ferry Many ferry services connect Northern Sardinia with the mainland. The main port is Porto Torres (around 40km from ICCN 2019), which is connected by ferry with Barcelona, Genoa, Civitavecchia, Marseille, Propriano.
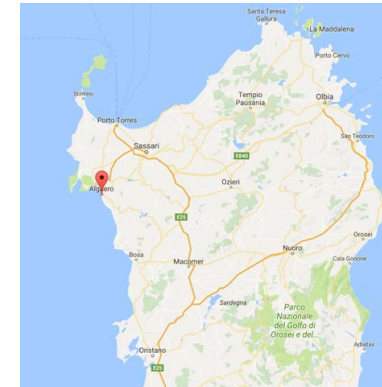
10:30-10:50
Feiyu Yin (East China University of Science and Technology)
PSO-Sub-ABLD based Parameter Optimization for motor imagery BCI

10:50-11:10
Xiuxin Wang (Chongqing University of Posts and Telecommunications)
Photoacoustic imaging of tibia fracture in rats

11:10-11:40
Zhipeng Liu (Chinese Academy of Medical Sciences & Peking Union Medical College)
Experimental study on transcranial electrical simulation based on magneto-acoustic effect

Wednesday, Oct.2, 2019 (Level 1 - Aula VII)
Keynote Lecture 5 (Chair: Dr. Alessandra Lintas)

11:40-12:25
Masamichi Sakagami *(Brain Science Institute, Tamagawa University, Machida, Japan)*
The enhancement of the reward prediction error signal in the midbrain dopamine neuron by the cost paid for the reward

12:30-13:30 (Level 0 - Aula I)
Light Lunch Buffet & Coffee Break

Wednesday, Oct.2, 2019 (Level 1 - Aula VII)
Poster Session

13:30-14:30
Qinyue Zheng (Huazhong University of Science and Technology) & Sihao Liu, Alessandro E.P. Villa, and Alessandra Lintas
Seizure Detection of Epileptic EEG Based on Multiple Phase-Amplitude Coupling Methods

13:30-14:30
Masashi Dotare (Yamaguchi University) & Yoshiyuki Asai, Sarah K. Mesrobian, Michel Bader, Alessandro E.P. Villa, and Alessandra Lintas
Training parameters with Dual N-Back task affect the outcome of the Attentional Network Task in ADHD patients

13:30-14:30
Manon Jaquerod (University of Lausanne) & Ramisha Knight, Alessandro E.P. Villa, and Alessandra Lintas
Event-Related Potentials and Fast Optical Imaging of Cortical Activity During An Auditory Oddball Task

13:30-14:30
Rossella Falcone (Section on Neural Coding and Computation, NIMH/NIH) & Mariko McDougall, David Weintraub, Tsuyoshi Setogawa, and Barry Richmond
Neural coding of reward value in richly modulated spike patterns in monkey ventrolateral prefrontal cortex

Wednesday, Oct.2, 2019 (Level 1 - Aula VII)
Imaging and decoding information (Chair: Dr. Simona Monaco)

14:30-14:50
Haixin Zhong (East China University of Science and Technology)
A CNN-inspired Model for Degradation Mechanism of Retina to V1

14:50-15:10
Simona Monaco (University of Trento)
Decoding real and imagined actions in the Early Visual Cortex

15:10-15:30
Pierre Bonzon (University of Lausanne)
Symbolic neural dynamics allow for reproducing optogenetics experiments

15:30-16:00 (Level 0 - Aula I)
Coffee Break

Wednesday, Oct.2, 2019 (Level 1 - Aula VII)
Neuromodulation and functional interactions (Chair: Prof. Woochang Lim)

16:00-16:20
Woochang Lim (Daegu National University of Education)
Equalization Effect in Interpopulation Spike-Timing-Dependent Plasticity in Neuronal Networks with Inhibitory and Excitatory Populations

16:20-16:40
Eriko Sugisaki (Tamagawa University)
Acetylcholine effects on STDP induced on spatial and non-spatial information in dentate gyrus

16:40-17:00
Yihong Wang (East China University of Science and Technology)
The maximum information principle of place cell activity

17:00-17:20
Takeshi Abe (Yamaguchi University)
Causal Interactions Among Cortical Regions During Sleep Based On fNIRS Recordings

17:20-17:40
Tao Zhang (Nankai University)
A new deep neural network inspired by directional mutual information between slow and fast neural information flow

17:40-18:00 (Level 1 - Aula VII)
Intermezzo by violinist Tamamo Ange Saito

Wednesday, Oct.2, 2019 (Level 1 - Aula VII)
Keynote Lecture 6 (Chair: Prof. Alessandro E.P. Villa)

18:00-18:45
Hiromichi Tsukada & Minoru Tsukada *(Brain Science Institute, Tamagawa University, Machida, Japan)*
Fractal Structure in Hokusai's "Great Wave" and the Memory Neural Network —Brain, Art and AI—

Wednesday, Oct.2, 2019 (Level 1 - Aula VII)
18:45-18:50
Farewell address and closing of ICCN 2019

19:00-23:00
Gala Dinner and Banquet
by Ristorante Quarte' Sayal Alghero

20:30
Intermezzo by violinist Tamamo Ange Saito

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Equalization Effect in Interpopulation Spike-Timing-Dependent Plasticity in Neuronal Networks with Inhibitory and Excitatory Populations

Sang-Yoon Kim and Woochang Lim

Abstract We consider clustered small-world networks with inhibitory (I) and excitatory (E) populations. This I-E neuronal network has adaptive dynamic I to E and E to I interpopulation synaptic strengths, governed by interpopulation spike-timing-dependent plasticity (STDP). In previous works without STDPs, fast sparsely synchronized rhythms, related to diverse cognitive functions, were found to appear in a wide range of noise intensity D for static synaptic strengths. Here, by varying D, we investigate the effect of interpopulation STDPs on fast sparsely synchronized rhythms that emerge in the I- and the E-populations. Depending on values of D, long-term potentiation and long-term depression for population-averaged values of saturated interpopulation synaptic strengths are found to occur, and they make effects on the degree of fast sparse synchronization. In a broad region of intermediate D, the degree of good synchronization (with higher synchronization degree) becomes decreased, while in a region of large D, the degree of bad synchronization (with lower synchronization degree) gets increased. Consequently, in each I- or E-population, the synchronization degree becomes nearly the same in a wide range of D. We note that this kind of equalization effect in interpopulation synaptic plasticity is in contrast to the Matthew (bipolarization) effect in intrapopulation (I to I and E to E) synaptic plasticity where good (bad) synchronization gets better (worse).

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Acetylcholine effects on STDP induced on spatial and non-spatial information in dentate gyrus

Eriko Sugisaki, Yasuhiro Fukushima, and Takeshi Aihara

Abstract Spatial and non-spatial information, coming from medial perforant path (MPP) and lateral perforant path (LPP) respectively, is considered to be integrated on granule cell in dentate gyrus (DG) to play an important role in learning and memory. At both connected sites on dendrite, the phenomenon of learning and memory of spike-timing dependent plasticity (STDP) is known to be induced. Meanwhile, acetylcholine (ACh) is released from cholinergic terminals in DG when attentional processes are paid. And there are reports that ACh enhanced STDP in CA1 area. In order to investigate the ACh effects on STDP and its mechanism in DG, STDP-inducing protocol was applied to measure STDP on MPP or LPP in the presence of eserine, furthermore, the changes in baseline amplitude during the STDP protocol were investigated. As the results, STDPs at both sites were enhanced if ACh receptors were activated, then clarified that the baseline amplitude was one of the factors for the enhancement on MPP. These findings suggest that spatial and non-spatial information are strengthened in learning and memory if attentional processes are paid, but the underlain mechanisms are different.

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