



INSTITUTO DE MATEMÁTICA E ESTATÍSTICA
UNIVERSIDADE DE SÃO PAULO

NeuroMat



PROGRAM

First Workshop of FAPESP's Center for Neuromathematics January 20-25, 2014, São Paulo, Brazil

Monday 20 January

10:00-11:00 Welcome and introduction

11:00-12:00 Ontology droplets

Statistical mechanics – **Roberto Fernández**, Utrecht

Neurons and single-unit recording – **Sidarta Ribeiro**, UFRN

Chains with memory of variable lengths – **Karina Yuriko Yaginuma**, USP

Random graphs – **Yoshiharu Kohayakawa**, USP

12:00-14:30 *Lunch break*

14:30-15:30 Session 1: The scientific project of NeuroMat and what we intend to do in the next months

Initial address: **Antonio Galves**, USP

General discussion: Scientific challenges of this project

15:30-15:45 *Coffee break*

15:45-17:45 Session 2: A stochastic model for biological neuronal nets (NeuroMat published paper)

Presentation: **Eva Löcherbach**, Cergy-Pontoise

Work in progress: Mathematical, statistical and biological issues suggested by this model –

Miguel Abadi, USP; **Roberto Fernández**, Utrecht; **Pablo Ferrari**, UBA and USP; **Aline**

Duarte de Oliveira, USP, and **Guilherme Ost**, USP; **Antonio Carlos Roque**, USP



Tuesday 21 January

09:00-10:15 Session 3: NeuroMat technology transfer, open source software, and open data

09:00-10:00 Presentation: **Fabio Kon**, USP

10:00-10:15 Work in progress: Fast generation of context tree models – **Arnaldo Mandel**, USP

10:15-10:45 *Coffee break*

10:45-12:00 Guest talk, **Martijn van den Heuvel**, Utrecht: Rich-club organization of the human connectome

Discussion and extensions: **Yoshiharu Kohayakawa**, USP; **Marcel de Reus**, Utrecht

12:00-14:00 *Lunch break*

14:00-15:30 Working groups

15:30-16:15 Ontology droplets

EEG, MEG – **Guillermo Cecchi**, IBM

DTI, fMRI – **Fátima Erthal**, UFRJ

Brain plasticity – **Felipe Fregni**, Harvard

16:15-16:45 *Coffee break*

16:45-18:45 Session 4: Development of NeuroMat open databases

Presentation 1: Computational issues – **Kelly Rosa Braghetto**, USP, and **Amanda Nascimento**, USP

Presentation 2: General issues and the experience of constructing a clinical database in a university hospital – **Cláudia Domingues Vargas**, UFRJ

Discussion: **Sérgio Neuenschwander**, UFRN; **Sidarta Ribeiro**, UFRN; **Ana Carolina Simões**, UFABC



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Wednesday 22 January

09:00-10:30 Guest talk, **Leonardo G. Cohen**, NIH: Neuroplasticity underlying learning in the healthy and lesioned brain

Discussion: **Adriana Conforto**, HC/FMUSP; **Cecília Hedin-Pereira**, UFRJ; **Cláudia Domingues Vargas**, UFRJ

10:30-11:00 *Coffee break*

11:00-12:00 Session 5: Work in progress

11:00-11:45 **Linamara Rizzo Batistella**, USP, **Felipe Fregni**, Harvard, **Jesus Enrique Garcia**, UNICAMP, **Veronica Gonzalez-Lopez**, UNICAMP, and **Marcel Simis**, IRLM: Predictors of motor recovery
11:45-12:00 General discussion

12:00-13:00 Session 6: Work in progress

12:00-12:45 **André Frazão Helene**, USP, **Abner Rodrigues Neto**, USP, and **Gilberto Xavier**, USP: Stochastic modeling of neurophysiological and behavioral data
12:45-13:00 General discussion

13:00-15:00 *Lunch break*



Thursday 23 January

09:00-10:00 Session 7: Biological motion coding in the brain: analysis of visually driven EEG functional networks (NeuroMat published paper)

Presentation: **Daniel Fraiman**, San Andrés, and **Cláudia Domingues Vargas**, UFRJ

10:00-10:30 *Coffee break*

10:30-12:00 Session 8: Stochastic modeling of neural encoding mechanism of complex visual stimuli

Presentation: **Sérgio Neuenschwander**, UFRN

Discussion: **Ricardo Fraiman**, Universidad de la Republica; **Antonio Galves**, USP

12:00-14:00 *Lunch break*

14:00-15:30 Working groups

15:30-17:00 Session 9: Work in progress

Florencia Leonardi, USP: Statistical analysis of random graphs applied to neuroscience

Jorge Stolfi, UNICAMP: Analyzing multi-electrode EEG signals

Daniel Yasumasa Takahashi, Princeton: Stochastic coupled oscillator dynamics of vocal turn-taking in monkeys

17:00-17:30 *Coffee break*

17:30-17:45 Ontology droplet

Statistical model selection – **Daniel Yasumasa Takahashi**, Princeton

17:45-18:00 Tutorial

Pydio: A powerful file-sharing platform – **Carlos Eduardo Ribas**, USP

18:00-18:45 Session 10: Work in progress

Susanne Ditlevsen, Copenhagen: Context tree description of interacting systems

Henrik Lindén, Copenhagen: Neuronal circuits: Mapping the local field potential



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Friday 24 January

09:00-10:30 Guest talk, **Guillermo Cecchi**, IBM: Dynamical Criticality: Theory and Application to ECoG

Discussion: **Antonio Galves**, USP; **Roberto Imbuzeiro Oliveira**, IMPA; **Cláudia Domingues Vargas**, UFRJ

10:30-11:00 *Coffee break*

11:00-12:00 Session 11: How do epileptic seizures begin? The contribution of brain-state transitions

Presentation: **Claudio Queiroz**, UFRN

12:00-14:00 *Lunch break*

14:00-15:30 Working groups

15:30-16:30 Session 12: Work in progress

Roberto Imbuzeiro Oliveira, IMPA: Statistical inference for time varying networks
Ricardo Fraiman, Universidad de la Republica, **Aline Duarte de Oliveira**, USP, and
Guilherme Ost, USP: Classifying EEG data driven by rhythmic stimuli

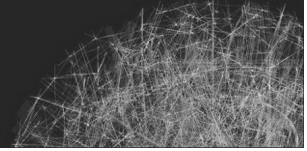
16:30-17:00 *Coffee break*

17:00-18:00 Guest talk, **Angel Caputi**, IIBCE: From the intrinsic properties to the functional role of a neuron phenotype



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Saturday 25 January

09:00-09:45 Session 13: Work in progress

Antônio Pereira, UFRN: Spatial cognition and numeracy: The SNARC effect

09:45-10:00 *Coffee break*

10:00-12:00 Final discussion and conclusions of the workshop

Concluding remarks: **Leonardo G. Cohen**, NIH