Neural Correlates of Anesthesia

Hyunwoo Jang, KAIST
14R55021
Advised by Prof. Yasuharu Koike
Precision and Intelligence Laboratory
1. My Life in Japan

2. Neuronal Modeling of Anesthesia

3. Additional Works
   Granger Causality on Sensorimotor Cortex
My Life in Japan
During July...

• One big goal of this summer was *to specify my research topic*
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• I found a keyword, ‘anesthesia and consciousness’
Neuronal Modeling of Anesthesia

- When a person is under general anesthesia, the brain wave pattern shows UP/DOWN state
- This is due to massive synchronization of cortex caused by thalamic control


Neuronal Modeling of Anesthesia

- I performed the modeling for increased inhibitory strength for same environment.
- Network with stronger inhibitory connections showed more synchronized pattern of spike.
Additional Works

Granger Causality on Sensorimotor Cortex

• Thanks to Professor Duk Shin, I had a chance to help him analyzing his ECoG data

• Granger causality:

\[
Y_t = \mu + \sum_{i=1}^{p} a_i Y_{t-i} + \sum_{j=1}^{p} b_j X_{t-j} + U_t
\]

\[
X_t = \mu' + \sum_{i=1}^{p-1} c_i Y_{t-i} + \sum_{j=1}^{p-1} d_j X_{t-j} + U'_t,
\]

a measure of how useful it is to know one time series to predict another.

Additional Works
Granger Causality on Sensorimotor Cortex

Filtering

Granger causality matrix
Granger Causality on Sensorimotor Cortex

1. My Life in Japan
2. Neuron Modeling
3. Additional Works

Additional Works

S1 (Primary sensory)  PMv (Premotor ventral)  FEF (Frontal eye field)

PMd (Premotor dorsal)  M1 (Primary motor)  PrePMd (Pre-premotor dorsal)

http://neurophilosophy.files.wordpress.com/2006/08/1-s2-0-s0166223696100254.jpg?w=253&h=172
I had a wonderful summer at Tokyo Tech. Thank you so much.