How to ORGANIZE BEHAVIORS in DFT

Hands-on summer school
Neural dynamics approaches to cognitive robotics
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ORGANIZING behaviors
3 TYPES of organization

1. Serial order
2. Behavioral organization
3. Goal-oriented sequences
1. Serial Order

arbitrary sequences
TRADITIONAL
sequence generation
IRREGULAR timing vs
Stability of action representation

- conflict between stability and sequentiality
- there must be a structure in the (neural) representation of an action
intention field

motor system

CoS field

perception
3 Cognitive Models of sequences

chaining

ordinal

positional

(Henson, 1998)
SERIAL ORDER architecture

(Sandamirskaya, Schöner, 2010)
a ROBOTIC example
Behavioral organization

flexibility
PRECONDITION constraint
COMPETITION constraint
a ROBOTIC example
(almost) the whole ARCHITECTURE
GRASPING and POINTING
ACTIVATION over time
3 Types of organization

1. Serial order
2. Behavioral organization
3. Goal-oriented sequences
Serial order EQUATIONS

\[
\tau \dot{d}_i(t) = -d_i(t) + h_d + c_0 f(d_i(t)) \\
- c_1 \sum_{i' \neq i} f(d_{i'}(t)) + c_2 f(d_{i-1}^m(t)) \\
- c_3 f(d_i^m(t)) - I_c(t)
\]

\[
\tau \dot{d}_i^m(t) = -d_i^m(t) + h_m + c_4 f(d_i^m(t)) \\
- c_5 \sum_{i' \neq i} f(d_{i'}(t)) + c_6 f(d_i(t))
\]
CREDITS

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