



Séminaire ISIR

Nicolas Schweighofer

Judi 31 janvier 2013 à 14h00

Campus Jussieu, 4 place Jussieu, Paris
Salle de réunion 211 (Tour 55-65)

Titre : "Computational neurorehabilitation: modeling recovery post-stroke".

"Although spontaneous use of the more-affected arm and hand after stroke is an important determinant of participation and quality of life, a number of patients exhibit decreases in use following rehabilitative therapy. Our general hypothesis that there exists a threshold for function of the paretic arm and hand after therapy.

If function is above this threshold, spontaneous use will increase in the months following therapy. In contrast, if function is below this threshold, spontaneous use will decrease. A previous "qualitative" neurocomputational model predicted that if the dose of therapy is sufficient to bring performance above a certain threshold, training can be stopped. Computer simulations are presented showing how changes in arm use following therapy depend on a performance threshold. This prediction was tested by reanalyzing the data from the extremity constraint-induced therapy evaluation (EXCITE) trial, phase III randomized controlled trial in which participants received constraint-induced movement therapy for 2 weeks and were tested both 1 week and 1 year after therapy. The results demonstrate that arm and hand function measured immediately after therapy predicts, on average, the long-term change of arm use. This reanalysis of the EXCITE trial data provides a group threshold above which a majority of patients, but not all, see spontaneous improvement in use following therapy.

Finally, we present a "quantitative" model, with parameters fitted to longitudinal data of individual patients recovering from stroke, that allow us to estimate the effect of therapy on the time-varying interactions between arm function and use."

Bio : Nicolas Schweighofer, PhD is an Associate Professor in the Department of Biokinesiology and Physical Therapy, and has joint appointments in the Neuroscience and Computer Science Departments at the University of Southern California (USC) and in Montpellier 1 University. Before joining USC, he was a researcher at ATR in Kyoto and head of R&D at Cerego, an educational software company based in Tokyo.

His research interest are Computational neural models of motor skill learning and motivation and Optimization of learning via adaptive practice schedules in healthy and stroke.

<http://www.m2h.euromov.eu/fr/accueil-membre.php?membre=124>