Curriculum Vitae Sander M. Bohte

Personalia:
Name: Sander M. Bohte
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Current Status: PhD-student at CWI

Professional Experience
2000 – pres.   Running private company BSW Webdesign, specializing in the design and maintenance of several websites.
1998 – pres.   PhD student at CWI.
1998   Application programmer for Remedy helpdesk and workflow systems at Mansystems, Amsterdam. Involved in the development of ITIL-compliant standardized helpdesk based on Remedy's ARS foundation.
1993   Summer job at IBM Netherlands in the computer-recycling department.

Education
1998 – pres.   PhD student at CWI, subject: spiking neural networks.

1995 – pres.   Exchange student at the University of Calgary in the graduate school for physics and computer science.

1992-1997   Obtained BSc and MSc in Experimental Physics at the University of Amsterdam

1987-1992   High school, valedictorian of class of 1992, skipped 3rd grade.

PhD-Advisors:
Name: prof. dr. Joost N. Kok
Affiliation(s): LIACS, Leiden University, and CWI
Address: P.O.Box 9512
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Postal: NL-2300 RA, The Netherlands
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Name: prof. dr. ir. Han La Poutré
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Areas of scientific interest

The subject of my PhD thesis is computation in spiking neural networks, with focused on learning algorithms and possible applications to dynamic information representation, a.k.a. the "binding problem".

Apart from this fundamental neural networks work, I am participating in the CWI project "Autonomous Systems of Trading Agents", where I my interest is in emergent competitive learning with software agents participating in massive e-commerce systems. For parts of my work, CWI and the Royal Netherlands Telecom (KPN) have jointly applied for a (worldwide) patent.

The work both emergent (competitive) intelligence and dynamic (variable) binding in neural networks is motivated by the desire to enable intelligent symbolic manipulation in AI-type systems, e.g. as in Minsky's Society of Mind. In the past, I have also participated in CWI-projects related to the practical application adaptive systems. Areas of current applications extend to unsupervised clustering of Remote Sensing data (in cooperation with the U.S. corps of engineers, Cold Region Research Engineering Laboratory, CRELL), as well as advance time-series prediction for Tunnel Drill guidance (in cooperation with an unnamed building contractor, patent pending, algorithms used have been presented at ESANN'2000).

List of publications.

Journal Papers

- *Unsupervised Clustering with Spiking Neurons by Sparse Temporal Coding and Multi-Layer RBF Networks,* S.M. Bohte, J.N. Kok and H.La Poutré, *submitted.*
- *Error-Backpropagation in Temporally Encoded Networks of Spiking Neurons*, S.M. Bohte, J.N. Kok and H.La Poutré, **Neurocomputing,** *to appear.*
- *The influence of pair-wise and higher order correlations on the firing rate of a post-synaptic neuron*, 2000, S.M. Bohte, H. Spekreijse and P.R. Roelfsema, **Neural Computation, 12(1)**, January 1, 2000.

Conference Contributions

- *Competitive Market-based Allocation of Consumer Attention Space,* S.M. Bohte, E. Gerding and H.La Poutré**, Proceedings of ACM EC'01, 2001,** Tampa, USA. *to appear.*
- *Learning in Spike-Time Encoded Neural Networks,* S.M. Bohte, H. La Poutré and J.N. Kok**, International Conference on Cognitive and Neural Systems (ICCNS) 2001**, Boston, USA.
- *Feedforward Dynamic feature Binding with Sparse Neural Vectors,* S.M. Bohte and J.N. Kok**, Proceedings of DYNN'2000,** Bielefeld, Germany.
- *Unsupervised classification in a Network of spiking neurons*, S.M. Bohte, H. La Poutré and J.N. Kok, **Proceedings of IJCNN'2000**, Como, Italy, extended paper has been invited for journal submission.

- *SpikeProp: An Error-Backpropagation for Networks of Spiking Neurons*, 2000, S.M. Bohte, H.La Poutré and J.N. Kok, **Proceedings of ESANN'2000,** Bruge, Belgium**.**
- *Algorithms for the detection of connectedness and their neural implementation*, 1998, P.R. Roelfsema, S.M. Bohte and H. Spekreijse. In: Parodi,O (Ed.), **Proceedings of the Corsican Neuroscience Summerschool 1997**, Cargese, France.

Workshops
Participant workshop "Neural selectivity", Paris, July 2000.
Participant workshop "Neural Coding", HanseWissenschaft Kolleg, Bremen, March 1999.
Participant summer school "Information processing in neural networks", Cargese, Corsica 1997.
Participant summer school on plasma physics, Garching bei Munchen, 1994.

Presented Seminars
okt 2001   *Spiking Neurons as a Model for Neural Computation: Counting on the single spike,* at the cognitive science institute of the University of Colorado,Boulder.

sept 2001   *Spiking Neurons as a Model for Neural Computation: Counting on the single spike,* at the theoretical psychology department of Leiden University.

june 2001   *Feature Binding with Timed Spike-Train Vectors*, at Jordan Pollack's DEMO lab.

june 2000   *Of neural codes and dynamic binding,* popular seminar for the SIG of the Netherlands computer society.

1998-2001   Various seminars at CWI on research progress in spiking neural networks.

Didactic Accomplishments
Teaching Assistantship, teaching "Physics for Chemistry students", 1995

Organizational Accomplishments
- organization of selected seminars for our group at CWI, 2000 --
- member of the CWI coordination group on computer-infrastructure, 1999 --
- secretary of the physics student fraternity, 1993-1996
- student member of the physics department board in 1995

Awards and grants
- 2001 Travel grant for the ICCNS'2001 conference in Boston, USA.
- 2000 Accommodation grant for the DYNN'2000 conference in Bielefeld, Ger.
- 2000 Student grant for the IJCNN'2000 conference in Como, Italy.
- 1997 Travel grant for the summer school "Information processing in neural networks" in Corsica.
- 1994 Student grant for the summer school on plasma physics, Munich, Ger.
- 1992 Award from the Goethe Institute Amsterdam for best graduation grade for German language.