

Prof. Dr. Gregor Schöner September 19, 2017

## Curriculum Vitae

### 1 Personal data

Name:	Prof. Dr. Gregor Schöner
Birthdate:	May 27, 1958, Sindelfingen, West Germany
Office address	Institut für Neuroinformatik Ruhr-Universität Bochum Universitätsstr. 150 44801 Bochum Germany tel: +49-234-322-7965 fax: +49-234-321-4209 email: <a href="mailto:Gregor.Schoner@neuroinformatik.ruhr-uni-bochum.de">Gregor.Schoner@neuroinformatik.ruhr-uni-bochum.de</a>
Home address	Neustr. 9 44787 Bochum, Germany tel: +49-234-640-6461

### 2 Education

1983–1985	Doctoral studies in theoretical physics at the Universität Stuttgart, West Germany; thesis supervisor: Prof. Hermann Haken
1979-1982	Physics “Diplom” ( $\sim$ M.Sc.) with a diploma thesis in theoretical physics at the Universität des Saarlandes, Saarbrücken, West Germany
1977-1979	Physics and mathematics “Vordiplom” ( $\sim$ B.Sc.), Universität des Saarlandes, Saarbrücken, West Germany

### 3 Professional experience

2003– present	Director of the Institut für Neuroinformatik
2003– present	joint appointment in the Faculty of Electrical Engineering and Information Technology of the Ruhr-Universität Bochum
2002– present	joint appointment in the Faculty of Physics and Astronomy of the Ruhr-Universität Bochum
Aug. 2001–present	Professor of Neuroinformatics, Chair for Theoretical Biology (Chair renamed to Theory of Cognitive Systems in 2010), Institut für Neuroinformatik, Ruhr-Universität Bochum, Germany
Oct. 1994–Jul. 2001	Directeur de Recherche, CNRS—Centre de Recherche en Neurosciences Cognitives, Marseille, France
Sept. 1989–Sept. 1994	Group leader (research), Institut für Neuroinformatik (Institute for Neurocomputing), Ruhr-Universität Bochum, Germany
Dec. 1988–Aug. 1989	Assistant Research Professor, Center for Complex Systems, Florida Atlantic University, Boca Raton, Florida, U.S.A.
March 1986–Nov. 1988	Research Associate, Center for Complex Systems, Florida Atlantic University, Boca Raton, Florida, U.S.A.
Jan.–Feb. 1986	Visiting Scientist, Haskins Laboratories, New Haven, Conn., U.S.A.
1983–1985	Research Assistant, Institut für theoretische Physik, Universität Stuttgart, West Germany
1979–1982	Teaching and Research Assistant, Institut für theoretische Physik der Universität des Saarlandes, Saarbrücken, West Germany

### 4 Awards, fellowships, visiting appointments

- Visiting Researcher, Infant Laboratory, Indiana University, Bloomington, IN, USA, 2005 — 2007
- Fellow at the ZiF (Center for Interdisciplinary Research) for the project “Embodied Communication”, Universität Bielefeld, Germany, October 2005 — September 2006
- Visiting Researcher, Infant Laboratory (Director Dr. Esther Thelen), Indiana University, Bloomington IN, USA, September–November 2000
- Visiting Scholar, Obermann Center for Advanced Study, University of Iowa, Iowa City, U.S.A., June 1999
- Short-Term Visitor, Institute for Research in Cognitive Science (IRCS), University of Pennsylvania, Philadelphia, U.S.A., February 1996
- Visiting Professor, Program in Cognitive Science, Indiana University, IN, U.S.A., April – June 1994

Fellow at the ZiF (Center for Interdisciplinary Research) for the project “Prerational Intelligence”, Universität Bielefeld, Germany, October 1993 – February 1994

Fellow in the Human Capital Mobility Program of the European Council at INESC (Institute for electronic engineering and telecommunications), Aveiro, Portugal, 1993 and 1994

Research Fellowship, Deutsche Forschungsgemeinschaft, Bonn, West Germany, 1986 – 1987

Scholarship of the “Studienstiftung des Deutschen Volkes”, Bonn, West Germany, 1977 – 1982

## 5 Professional activities

Editor in Chief *Paladyn*, Member of the Editorial Board of *Cognitive Neurodynamics*.

Former Member of the Editorial Boards of *Biological Cybernetics*, *Motor Control*, and *Journal of Motor Behavior*

Ad-hoc reviewer for funding agencies” *Deutsche Forschungsgemeinschaft*, *ERC*, *EuroCore*, *European Science Foundation*, *EU Commission FP7*, *EU Commission H2020*, *INRIA*, *German-Israeli Foundation*, *Medical Research Council*, *Minerva Foundation*, *National Science Foundation (U.S.A.)*, *Netherlands Organization for Scientific Research*.

Ad-hoc reviewer for scientific journals and publishers: *Acta Psychologica*, *Adaptive Systems*, *British Journal of Mathematical and Statistical Psychology*, *Bulletin of Mathematical Biology*, *Cognitive Science*, *Cortex*, *Developmental Science*, *Experimental Brain Research*, *Fusion*, *Human Movement Science*, *Infancy*, *International Journal of Psychology*, *International Journal of Robotics Research*, *IEEE Transactions on Robotics and Automation*, *IEEE Transactions on Intelligent Transport Systems*, *IEEE Transactions on Autonomous Mental Development*, *IEEE Transactions on Systems Man & Cybernetics, Part A*, *Journal of Experimental Psychology: Human Perception and Performance*, *Journal of the Franklin Institute*, *Journal of Mathematical Biology*, *Journal of Mathematical Psychology*, *Journal of Motor Behavior*, *Journal of Neurophysiology*, *Journal of Neuroscience*, *Journal of the Royal Society Interface*, *MIT Press*, *Nature*, *Nature Communications*, *Neural Computation*, *Neural Networks*, *Perception & Psychophysics*, *PLoS One*, *Proceedings of the National Academy of Sciences (U.S.A.)*, *Psychological Review*, *Psychological Research*, *Quarterly Journal of Experimental Psychology*, *Robotics and Autonomous Systems*, *The Visual Computer*, *Vision Research*, *Wellcome Trust*, *Zeitschrift für Physik*.

Member of Scientific Committee and reviewer of conferences such as *CEM*, *EpiRob*, *Gait and Posture*, *Humanoid*, *ICDL*, *ICRA*, *IROS*, *NIPS*, *ROMAN*, *SAB*

## 6 Organization of scientific meetings

Summer School “Dynamic Field Theory”, Bochum, Germany, August 2017

Summer School “Neural dynamics approach to cognitive robotics”, sponsored by the EU Cognition III network, Bochum, Germany, August 2014

Member Conference EU Cognition III network “Embodied communication”, Bochum, March 2014

Autumn School “Neural dynamics approach to cognitive robotics”, sponsored by the EU Cognition III network, Bochum, Germany, September 2013

Dynamic Field Theory Tutorial Session at Cognitive Science, Berlin, Germany, July 2013

Dynamic Field Theory Tutorial Session at SAB 2012 “From Animals to Animats”, Odense, Denmark, September 2012

Autumn School “Neural dynamics approach to cognitive robotics”, sponsored by the EU Cognition III network, Bochum, Germany, September 2012

Autumn School “Neural dynamics approach to cognitive robotics”, sponsored by the EU Cognition II network, Guimarães, Portugal, September 2011

Autumn School “Neuronal dynamics approaches to cognitive robotics”, sponsored by the EU Cognition II network, Bochum, September 2010.

Dynamic Field Theory Tutorial Session at Cognitive Science, Portland, USA, July 2010

Dynamic Field Theory Summer School at the University of Iowa, USA. June 2010

Dynamic Field Theory Tutorial Session at Cognitive Science, Amsterdam, The Netherlands, July 2009

Dynamic Field Theory Summer School at the University of Iowa, USA. June 2009

Interdisziplinäres Kolleg IK 2009, Günne, Germany, March 2009

Dynamic Field Theory Tutorial Session at Cognitive Science, Washington DC, USA, July 2008

Dynamic Field Theory Summer School at the University of Iowa, USA. May 2008

Symposium on “Scientific Methods for the Analysis of Agent-Environment Interaction” at AISB’03 Cognition in Machines & Animals, Aberysthwyth, April 2003 (jointly with Ulrich Nehmzow)

International workshop on: “Dynamic approach to behavioral, neural and robotic systems — action, perception, and cognition”, Guimarães, Portugal. Co-organized with Dr. John Jeka (Univ. Maryland). Funded by the National Science Foundation (USA) and the Fundação Ciência e Tecnologia (Portugal), July 22-30, 1998

Special session on Autonomous Vehicles at the IEEE Conference ISIE'97, Guimarães, Portugal, July 1997

Conference in homage to Jean Requin on “Neural Substrates of Cognitive Processes”, CNRS Marseille, France, May 1997 (member of organizing committee)

Symposium “Rhythmic and Discrete Movement: The Challenge of a Unified Account”, part of the 8th International Conference on Perception and Action, Marseille, July 9-14, 1995 (jointly with Dr. Guiard).

Workshop-Tagung im Schwerpunktprogramm der Deutschen Forschungsgemeinschaft “Physiologie und Theorie neuronaler Netzwerke”, Bochum, Germany, June 21-23, 1993 (jointly with Dr. Wörgötter and Dr. Dinse)

Neurobiologen Mittelbauertreffen: Zeitstruktur und Funktion von Gehirnen – Theorie und Experiment. Gemen, Germany, May 6-8, 1992 (jointly with Dr. Krüger and Dr. Dinse)

## 7 Academic theses advised

Supervision of doctoral theses:

1. Klaus Kopecz, doctoral thesis in physics: “Dynamische Theorie reizevozierter 10 Hz Oszillationen im somatosensorischen Cortex der Ratte”, Fakultät für Physik, Ruhr-Universität Bochum, Germany, 1993
2. Tjeerd Dijkstra, doctoral thesis in biophysics: “Visual control of posture and visual perception of shape”. Member of thesis committee, Department of Biophysics and Medical Physics, University of Nijmegen, The Netherlands, 1994
3. Michael Dose, doctoral thesis in computer science: “Wegeplanung autonomer mobiler Roboter mittels dynamischer Systeme” Abteilung Informatik, Universität Dortmund, Germany, 1994
4. Christoph Engels, doctoral thesis in computer science: “Dynamische Feldarchitektur zur autonomen Robotersteuerung mit subsymbolischer Hindernisrepräsentation”. Abteilung Informatik, Universität Dortmund, Germany, 1995
5. Wolfram Erlhagen, doctoral thesis in mathematics: “Dynamische neuronale Felder zur Modellierung der Motorprogrammierung”. Fakultät für Mathematik, Ruhr-Universität Bochum, Germany, 1996.
6. Dirk Jancke, doctoral thesis in biology: “Populations-Repräsentationen des Ortes im Gesichtsfeld: Interaktion und Dynamik im primären visuellen Cortex der Katze” (co-adviser with Dr. Dinse), Fakultät für Biologie, Ruhr-Universität Bochum, Germany, 1997
7. Axel Steinhage, doctoral thesis in physics: “Dynamical systems for the generation of navigation behavior”. Fakultät für Physik, Ruhr-Universität Bochum, Germany, January 1998

8. Martin Giese, doctoral thesis in electrical engineering: “A dynamical model for the perceptual organization of apparent motion”. Fakultät für Elektrotechnik, Ruhr-Universität Bochum, Germany, January 1998
9. Estela Guerreiro da Silva Bicho, doctoral thesis in electrical engineering: “The dynamic approach to autonomous robotics”, Departamento de Electrónica Industrial, Universidade do Minho, Portugal, December 1999
10. Cristina Santos: “Attractor dynamics generate stable timing of discrete and rhythmic robotic trajectories”. Departamento de Electrónica Industrial, Universidade do Minho, Portugal, December 2003
11. Stefan Schneider: “Modellierung der Planung sakkadischer Augenbewegungen mit exzitatorisch-inhibitorischen neuronalen Feldern”. Fakultät für Physik, Ruhr-Universität Bochum, Germany, April 2004
12. Valère Martin “A dynamical systems account of the uncontrolled manifold and motor equivalence in human pointing movements”. International Graduate School of Neuroscience, Ruhr-Universität Bochum, Germany, June 2005
13. Evelina Dineva: “Dynamic Field Theory of Infants’ Reaching and its Dependence on Behavioral History and Context”. International Graduate School of Neuroscience, Ruhr-Universität Bochum, Germany, July 2005
14. Claudia Wilimzig: “Dynamische Feldtheorie der kognitiven Informationsverarbeitung”, Fakultät für Psychologie, Ruhr-Universität Bochum, Germany, May 2006
15. Alexander Geppert: “Neural learning methods for visual object detection”, Fakultät für Physik, Ruhr-Universität Bochum, Germany, May 2006
16. Ioannis Iossifidis: “Dynamische Systeme zur Steuerung anthropomorpher Roboterarme in autonomen Robotersystemen”, Fakultät für Physik und Astronomie, Ruhr-Universität Bochum, Germany, June 2006
17. Aalzen Wiegersma: “Real-time pedestrian detection in FIR and grayscale images”, Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, November 2006
18. Josh Goldberg: “When, not were: A Dynamical Field Theory of infant gaze”. Cognitive Science Program, Indiana University, Bloomington, IN USA, July 2008
19. Christian Faubel: “Object recognition with dynamic neural fields”. Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, March 2009
20. Yulia Sandamirskaya: “Sequence generation in Dynamic Field Theory”. Fakultät für Physik und Astronomie, Ruhr-Universität Bochum, Germany, December 2010

21. Ürün Dogan, "Training Multiclass Support Vector Machines", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, 2011
22. Jan Salmen, "Robuste echtzeitfähige Fahrer-Assistenzsysteme", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, June 2013
23. Hendrik Reimann, "Principles of selective stabilization in high-dimensional state spaces: statistical concepts, dynamic modeling and robotics", Fakultät für Mathematik, Ruhr-Universität Bochum, Germany, July 2013
24. Farid Obbati, "Autonomous generation and on-line updating of sequences of timed robotic actions: an attractor dynamics approach." Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, July 2014
25. Eunse Park, "Multi-segment Control for the Upright Standing Posture", Biomechanics and Movement Science, University of Delaware, Newark DE, USA, July 2015
26. Marc Schlipsing, "Videobasierte Leistungserfassung im Fußball", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, September 2014
27. Johannes Stallkamp, "Framework zur Entwicklung, Bewertung und Analyse von Computer-Vision-Anwendungen im Kontext umfelderfassender Fahrerassistenzsysteme", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, October 2014
28. Sebastian Noth, "A Multi-User Driving Simulator for Studying Human Driving", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, November 2014
29. Sebastian Schneegans, "Dynamic Field Theory of Visuospatial Cognition", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, March 2015
30. Sebastian Houben, "Bildverarbeitende Algorithmen zur Fahrerassistenz mit Weitwinkelkameras", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, November 2015
31. Stephan Zibner, "A Neuro-Dynamic Architecture for Autonomous Visual Scene Representation", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, June 2016
32. Oliver Lomp, "Object recognition in dynamic field theory", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, June 2017
33. Claudius Strub, "A Neurodynamic Model for Haptic Spatiotemporal Integration" Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, June 2017

34. Eva Hansen, “Koartikulation bei menschlichen Armbewegungen”, Fakultät für Biologie und Biotechnologie, Ruhr-Universität Bochum, Germany, September 2017

## 8 Research grants

1. Dynamic patterns in complex biological systems. Duration: 1987-1989; Agency: National Institut of Mental Health, Washington, D.C., U.S.A. (MH42900-02); role: co-PI; PI: J.A.S. Kelso; Total: US \$906 634.
2. “Kategorische Wahrnehmung als Phänomen nichtlinearer Dynamik” (Categorical perception as a phenomenon of nonlinear dynamics). Duration: 1990; Agency: Grant for scientific collaboration from the Deutscher Akademischer Austauschdienst Bonn, Germany (DAAD 313-AI-p-es/dr); Role: PI; Total: 4 120 DM;
3. Travel grant from the Deutsche Forschungsgemeinschaft (DFG), Bonn, Germany, 1990; Total: 3 000 DM
4. “Dynamische Theorie der Wahrnehmungs-Bewegungs-Muster” (Dynamic theory of action-perception patterns). Duration: 1990-1992; Agency: Research grant Ministerium für Wissenschaft und Forschung Nordrhein-Westfalen (MWF-NWR), Düsseldorf, Germany; Role: PI; Total: 50 000 DM.
5. “Kategorische Wahrnehmung als Phänomen nichtlinearer Dynamik” (Categorical perception as a phenomenon of nonlinear dynamics). Duration: 1991; Agency: grant for scientific collaboration of the Deutscher Akademischer Austauschdienst (DAAD 313-AI-p-es/zk), Bonn, Germany; Role: PI; Total: 4 100 DM
6. “Zeitstruktur cortikaler Funktion und dynamische Theorie” (Temporal structure of cortical function and dynamic theory). Duration: 1992-1996; Agency: Research grant of the Deutsche Forschungsgemeinschaft, Bonn, Germany (DFG: Scho 336/4-2 and Di 334/5-1); role: PI, jointly with H. Dinse; Total: 358 000 DM.
7. “Systemflexibilität in dynamischen neuronalen Feldern” (Flexibility of systems through neural dynamic fields). Duration: 1994-1996; Agency: Research grant of the Deutsche Forschungsgemeinschaft (DFG: Scho 336/3-1), Bonn, Germany; co-PI: W. von Seelen; Total: 90 000 DM.
8. “Dynamic Approach to Autonomous Robotics.” Duration: 1997-1998; Agency: TMR grant in category “Senior Scientist” of the European Commission (ERB-4001-GT-965204), Bruxelles, Belgium; Role: PI; Total ECU 15 000.
9. “Les robots mobiles comme outils de simulation de la dynamique de modèles neurobiologiques: Adaptation et apprentissage dans des taches de navigation visuelle.” Duration: 1999-2000; Agency: GIS Sciences de la Cognition, Paris, France; Role: PI jointly with M. Quoy; Total FF 250 000.



10. “Théorie du champ neuronal dynamique: observation des processus de la mémoire motrice au niveau des populations des neurones corticaux.” Duration: 1999-2000; Agency: GIS Sciences de la Cognition, Paris, France; Total FF 200 000.
11. “Projet d’aide à la navigation en fauteuil roulant électrique par l’utilisation de la dynamique des attracteurs et des repousseur.” Duration: 2000-2001; Agency: Agence Nationale de Valorisation de la Recherche, Paris, France; Role: PI; Total FF 100 000
12. “Des facteurs spécifiques du langage modulent-ils l’extraction d’information visuelle de bas niveau pendant la lecture?”. Duration: 2001-2002; Agency: Ministère de la Recherche, ACI Cognitive, Paris, France; Role: PI jointly with T. Nazir; Total: FF 500 000.
13. “SOLESYS: Strukturoptimierung lernender Systeme” (Optimization of the structure of learning systems). Duration: 2002-2004; Agency: Research grant of the Deutsche Forschungsgemeinschaft (DFG: Scho 336/5-3), Bonn, Germany; co-PI: W. von Seelen; Total: 183 000 Euro.
14. “MORPHA” Aufstockungsantrag zum Leitprojekt, Duration: 2002-2003; Agency: Bundesministerium für Bildung und Forschung (BMBF), Berlin, Germany; Role: co-PI within a consortium; Total: 156 000 Euro.
15. “Dynamische Feldtheorie des sensomotorischen Entscheidungsfällens und des “on-line updating” “ (Dynamic field theory of sensori-motor decision making and on-line updating), Duration: 2002-2004; Agency: Research grant of the Deutsche Forschungsgemeinschaft (DFG: Teilprojekt B12 des SFB 509 Neurovision), Bonn, Germany; Role: PI; Total: approx. 150 000 Euro.
16. “Analyse und Modellbildung des Tiefbohrprozesses mit Methoden der Statistik und neuronalen Netzen” (Analysis and modelling of deep hole drilling using methods of statistics and neural networks). Duration: 2003-2005; Agency Research grant of the Deutsche Forschungsgemeinschaft (DFG: Teilproject C5 des SFB 475), Bonn, Germany; Role: co-PI jointly with C Wheis, K Weinert; Total: 174 000 Euro.
17. “DISMAR”, European Commission, 5th Framework Program; Duration: July 2002-July 2005; Role: PI; Total: 147 201 Euro
18. “Verbundprojekt OrthoMIT: Teilprojekt 7: Intraoperativer Ultraschall”, Duration: 2005-2008; Agency: Bundesministerium für Wissenschaft und Forschung, Berlin, German, (BMBF-01EQ0424); Role: co-PI jointly with Prof. Ermert; Total: 886 661 Euro.
19. “Verbundprojekt DESIRE: Teilprojekte AP1, AP4, AP6”, Duration 2005-2009; Agency: Bundesministerium für Wissenschaft und Forschung, Berlin, Germany; Role: Co-PI; Total: 496 420 Euro.
20. “Dynamical Factors in the Development of Motor Skill”, Duration 2005-2006, Agency: National Institute of Health (HD-22830-20); Role: co-PI, former PI: Esther Thelen, co-PI John Spencer, Total: 977 687 US Dollars

21. “From where to what: The dynamics of spatial cognition”. Duration Dec 2005- Nov 2008; Agency: National Science Foundation (USA) BCS-0527698; Role: co-PI, PI: John Spencer; Total: 624 006 US Dollars
22. “The grounding of higher brain function in dynamic neural fields”; Duration: 2007-2010; Agency: Bundesministerium für Bildung und Forschung, Berlin, Germany; Role: PI; Total: 979 477 Euro.
23. “A dynamic neural field theory of what-where integration”, Duration: 2008-2013; Agency: National Institute of Mental Health (USA), Role: co-PI, PI: John Spencer; Total: 787 500 US Dollars direct cost
24. “EU Cog II”, European Network for Artificial Cognitive Systems, Duration: 2009-2011; Agency: EU Commission, Brussels, Belgium. Role: co-PI with 6 other colleagues, coordinator: Vincent Müller, Athens, Greece; Total: 2,7 Million Euro
25. “Learning behavioral models: From human experiment to technical assistance systems”. Duration: 2009-2014; Agency: Bundesministerium für Bildung und Forschung, Berlin, Germany; Role: PI; Total: 1,9 Million Euro
26. “Echtzeitfähige Bildverarbeitung”. Duration: 2010-2011; Agency: Bundesministerium für Wirtschaft, Berlin, Germany; Role: PI; Total: 141 519 Euro.
27. “Multi-joint coordination in upright stance: The uncontrolled manifold helps decouple control of body-in-space from control of other degrees of freedom”. Duration: 2010-2013; Agency: Deutsche Forschungsgemeinschaft, Bonn, Germany (SCHO 336/7-1); Role: PI; Total: 335 400 Euro
28. “NeuralDynamics”. Duration: 2011-2015; Agency: European Commission, Brussels, Belgium, Role: PI and Coordinator; Total: 3 050 070 Euro for consortium of which 1 352 600 for own project
29. “The Emergence of Cognitive Flexibility in Neural-Behavioral Systems”. Duration: 2010-2012; Agency: National Science Foundation (USA); Role: Co-PI, PI: John Spencer; Total: approx. 1,1 Million US Dollar.
30. “Eu Cognition III” European Network for Artificial Cognitive Systems, Duration: 2011-2013; Agency: EU Commission, Brussels, Belgium. Role: co-PI with 6 other colleagues, coordinator: Vincent Müller, Athens, Greece; Total: 2,9 Million Euro
31. “Development as autonomous learning: Emergence of developmental stages that lead from sensori-motor behaviors to embodied cognition”. Duration: 2012-2014; Agency: Deutsche Forschungsgemeinschaft, Bonn, Germany (SCHO 336/8-1); Role: PI; Total: 285 100 Euro.
32. “Emotion, Eskalation, Gewalt. Entwicklung eines video-basierten Verfahrens zur Früherkennung von Emotionsprozessen bei Grossveranstaltungen.” Duration: 2014-2017; Agency: Deutsche Forschungsgemeinschaft, Bonn, Germany (SCHO 336/10-1); Role: PI jointly with Prof. Reichertz Total: 221 616 Euro

## 9 Industry research projects

1. Project “Robuste Bewertung von segmentierten Bildbereichen” HONDA Research Europe GmbH; duration: 01.09.2002 - 28.02.2003; total: 30 000 Euro
2. Project “INVENT - Fahrerwunscherkennung für FAS Entwicklungsarbeiten”; Audi AG; duration: Dec.2001 - Feb 2003; total 93 950 Euro
3. Project “Optimierung der Parametrisierung der Fahrspurfindung” AUDI AG; duration: Dec 2002 - 31.01.2003; total: 22 000 Euro
4. Project “Invent”, SIEMENS VDO Automotive; duration: 2002 - 2005, total 300 000 Euro
5. Project “Parameteroptimierung für Verfahren zur Fahrbahnranddektektion”, BOSCH GmbH; duration: 01.11.2003 - 31.10.2004; total 75 000 Euro
6. Project “Untersuchung eines lernfähigen Verfahrens zur modellbasierten Detektion von Objekten in einem Videostrom”; HONDA Research Europe GmbH; duration: 01.09.2003 - 28.02.2004; total: 25 000 Euro
7. Project “Fussgängererkennung in FIR-Bildern”, BMW AG; duration: 20.04.2004 - 31.03.2005; total: 100 000 Euro
8. Project “Distributed embedded driver assistance systems”, Nokia Research Center Bochumm GmbH, duration: 1.7.-31.12.2007; 45 000 Euro
9. Project “Fusion von Karten, GPS und Videodaten”, Bosch GmbH, duration: 2007-2009, total 175 000 Euro
10. Project “Stereosehen in der Fahrerassistenz”, Continental AG, duration: 2008-2009, total 80 000 Euro

## 10 Publications

### 10 A Books

1. Schöner, G., Spencer, J., and the DFT Research Group: *Dynamic Thinking — A Primer on Dynamic Field Theory*. Oxford University Press, Oxford/New York, 2016

### 10 B Articles in refereed journals

1. Schöner, G.: Renormalized perturbation theory for a multiplicative noise system. *Zeitschrift für Physik* **B59**, 213-222 (1985)
2. Schöner G., Haken H. & Kelso, J.A.S.: A stochastic theory of phase transitions in human hand movements. *Biological Cybernetics* **53**, 247-257 (1986)
3. Schöner G. & Haken H.: The slaving principle for Stratonovich stochastic differential equations. *Zeitschrift für Physik* **B63**, 493-504 (1986)

4. Kelso J.A.S., Scholz J.P. & Schöner G.: Nonequilibrium phase transitions in coordinated biological motion: Critical fluctuations. *Physics Letters* **A118**, 279-284 (1986)
5. Kelso J.A.S., Schöner G., Scholz J.P. & Haken H.: Phase-locked modes, phase transitions and component oscillators in biological motion. *Physica Scripta* **35**, 79-87 (1987)
6. Kay B.A., Kelso J.A.S., Saltzman E.L. & Schöner G.: The space-time behavior of single and bimanual rhythmical movements: data and model. *Journal of Experimental Psychology: Human Performance and Perception* **13**, 178-182 (1987)
7. Schöner G. & Haken H.: A systematic elimination procedure for Ito stochastic differential equations and the adiabatic approximation. *Zeitschrift für Physik* **B68**, 89-103 (1987)
8. Scholz J.P., Kelso J.A.S. & Schöner G.: Nonequilibrium phase transitions in coordinated biological motion: Critical slowing down and switching time. *Physics Letters* **A123**, 390-394 (1987)
9. Schöner G. & Kelso J.A.S.: A synergetic theory of environmentally-specified and learned patterns of movement coordination. I. Relative phase dynamics. *Biological Cybernetics* **58**, 71-80 (1988)
10. Schöner G. & Kelso J.A.S.: A synergetic theory of environmentally-specified and learned patterns of movement coordination. II. Component oscillator dynamics. *Biological Cybernetics* **58**, 81-89 (1988)
11. Kelso J.A.S. & Schöner G.: Self-organization of coordinative movement patterns. *Journal of Human Movement Science* **7**, 27-46 (1988)
12. Schöner G. & Kelso J.A.S.: A dynamic pattern theory of behavioral change. *Journal of Theoretical Biology* **135**, 501-524 (1988)
13. Schöner G. & Kelso J.A.S.: Dynamic pattern generation in behavioral and neural systems. *Science* **239**: 1513-1520 (1988)
14. Kelso J.A.S., Scholz J.P., Schöner G.: Dynamics governs switching among patterns of coordination in biological movement. *Physics Letters* **A134**, 8-12 (1988)
15. Schöner G.: Learning and recall in a dynamic theory of coordination patterns. *Biological Cybernetics* **62**, 39-54 (1989)
16. Schöner G., Jiang W.Y., Kelso J.A.S.: A synergetic theory of quadrupedal gaits and gait transitions. *Journal of Theoretical Biology* **142**, 359-391 (1990)
17. Schöner G.: A dynamic theory of coordination of discrete movement. *Biological Cybernetics* **63**, 257-270 (1990)
18. Schöner G.: Dynamic Theory of Action-Perception Patterns: The “moving room” paradigm. *Biological Cybernetics* **64**, 455-462 (1991)

19. Schöner G., Zanone P. G., Kelso, J.A.S.: Learning as change of coordination dynamics: Theory and Experiment. *Journal of Motor Behavior* **24**, 29-48 (1992)
20. Schöner G., Castro S. L. F.: Ciência da fala e Sinérgica. *Revista de Psicologia e Ciências de Educação* **3/4**, 49-55 (1992)
21. Schöner G., Kopecz K., Spengler F., Dinse H.: Evoked oscillatory cortical responses are dynamically coupled to peripheral stimuli. *Neuroreports* **3**, 579-582 (1992)
22. Schöner G., Dose M.: A dynamical systems approach to task-level system integration used to plan and control autonomous vehicle motion. *Robotics and Autonomous Systems* **10**, 253-267 (1992)
23. Hock H., Kelso J. A. S., Schöner G.: Perceptual stability in the perceptual organization of apparent motion patterns. *Journal of Experimental Psychology: Human Perception and Performance* **19**, 63-80 (1993)
24. Kopecz, K., Schöner, G., Spengler, F., Dinse, H. R.: Dynamic properties of cortical, evoked (10 Hz) oscillations. Theory and experiment. *Biological Cybernetics* **69** 463-473 (1993)
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  115. Tekülve, J., Zibner, S.K.U., Schöner, G.: A neural process model of learning to sequentially organize and activate pre-reaches. *Proceedings of the 6th International Conference on Development and Learning and on Epigenetic Robotics*, Paris, France (2016) (8 pages)

## 11 Talks (selection)

1. Stochastische Theorie eines Phasenübergangs im menschlichen Bewegungsverhalten (talk). Meeting on nonlinear dynamics of the Deutsche Physikalische Gesellschaft, Bad Honnef, Germany, September 1985
2. Synergetik als Theorie spontaner Strukturbildung (talk). Annual meeting of the Vereinigung Deutscher Wissenschaftler, Bochum, Germany, October 1985
3. Synergetik am Beispiel des menschlichen Bewegungs- und Sprachverhaltens (talk). Colloquium of the Zentrum für Interdisziplinäre Forschung, Universität Bielefeld, Germany, November 1985
4. Stochastic theory of phase transitions in human bimanual coordination (talk). Haskins Laboratories, New Haven, Conn., U.S.A., February 1986

5. Dynamics of motor coordination (talk). ONR Contractors Meeting (ONR1142PT) on Attention and Action. Eugene, Oregon, U.S.A., October 1986
6. A synergetic approach to coordination and control in multidegree of freedom speech and limb movements (talk). 26th Annual Meeting of the Society for Psychophysiological Research, Montreal, Quebec, Canada, October 1986
7. Dynamic patterns of biological coordination: Theoretical strategy and new results (talk). Meeting on “Dynamic Patterns in Complex Systems”, Co-organizers: ONR, NIMH, Laboratory for Biological Dynamics and Theoretical Medicine UCSD & FAU, Fort Lauderdale, Florida, U.S.A., October 1987
8. Synergetic theory of movement coordination: recognition and learning of environmentally elicited patterns (talk). 17th Annual Meeting of the Society for Neuroscience, New Orleans, U.S.A., November 1987
9. Synergetic theory of biological coordination (talk). Colloquium do Departamento da Fisica, Universidade do Porto, Portugal, January 1988
10. Synergetic theory of biological coordination (talk). Colloquium of the Neurological Sciences Institute, Good Samaritan Hospital, Portland, Oregon, U.S.A., March, 1988
11. A dynamic theory of learning and recall of behavioral patterns (poster). Gordon Research Conference on Theoretical Biology and Biomathematics, Tilton, New Hampshire, U.S.A., June 1988
12. A dynamic theory of learning and recall (talk). International Neural Network Society First Annual Meeting, Boston, Mass., U.S.A., September 1988
13. Dynamic theory of biological coordination: Phenomenological synergetics and behavioral information (talk). Bioholonics Symposium 1989 on Biological Complexity and Information, NIRA, Fuji Institute, Susono City, Japan, April 1989
14. Theoretical models for learning in complex systems (talk). Engineering Foundation Conference on Biomechanics and Neural Control of Movement. Potosi, Missouri, U.S.A., May 1989
15. Dynamische Theorie der Koordination (talk). Seminar at the Max Planck Institut für Verhaltensphysiologie, Seewiesen, Germany, June 1989
16. Dynamic theories of behavioral patterns (talk). Séminaires de Psychologie Cognitive et de Sciences Cognitives, Laboratoire de Psychologie expérimentale, Université libre de Bruxelles, Brussels, December 1989
17. Dynamic theory of discrete movement coordination (poster). International Conference on Parallel Processing in Neural Systems and Computers (ICNC), Düsseldorf, Germany, March 1990
18. Information in der dynamischen Theorie der Bewegungskoordination (talk). Interdisziplinäres Seminar des SFB 200, Heinrich-Heine-Universität Düsseldorf, Germany, April 1990



19. A dynamic theory of quadrupedal gaits and gait transitions (poster). 18th Göttingen Neurobiology Conference, Göttingen, Germany, June 1990.
20. Information in a dynamic theory of behavioral patterns (talk). Joint International Conference on Neural Networks 1990, San Diego, U.S.A., June 1990
21. Dynamische Theorie biologischer Koordination (talk). Seminar des Zentrums für interdisziplinäre Forschung, Universität Bielefeld, Germany, October 1990
22. Dynamic properties of neural response – New theoretical methods for understanding temporal structure (poster). 19te Göttinger Neurobiologentagung, Göttingen, Germany, May 1991
23. Temporal transfer characteristics are affected by a low-frequency oscillatory temporal structure in rat somatosensory cortex (poster). 19te Göttinger Neurobiologentagung, Göttingen, Germany, May 1991
24. The problem of biological coordination: Dynamic theory and experiment (talk). Faculteit der natuur- en sterrenkunde, Rijksuniversiteit te Utrecht, Utrecht, The Netherlands, July 1991
25. Dynamic theory of biological coordination (talk). Different versions given at:  
Physikalisches Kolloquium, Ruhr-Universität Bochum, Bochum, Germany, July 1991  
Mathematisches Institut, Universität Köln, Germany, November 1991  
Institut für theoretische Physik, Universität Frankfurt, Germany, November 1991  
Fakultät Biologie, Universität Köln, Germany, December 1991
26. How general is interlimb coordination? (talk) at: The control and modulation of patterns of interlimb coordination: A multidisciplinary perspective. The Human Frontier Science Program. Leuven, Belgium, June 1-5, 1992
27. From interlimb coordination to action-perception coupling: common principles (talk). At: 2nd European Conference on Ecological Psychology, Glasgow, Scotland, June 24-26, 1992
28. Are nervous systems governed by equations of motion? (talk). Biomedical Institute Abel Salazar, Porto, Portugal, November 3, 1992
29. Mini lecture series: Dynamical systems in perception, action and neural systems  
Information and dynamics for action and perception systems  
Toward a dynamic theory of perceptual organization  
given in the Program for Cognitive Science, Indiana University, Bloomington, IN, U.S.A., November 1992
30. The problem of coordination in movement and perception: Dynamic theory and experiment (talk). Séminaire du Laboratoire des Neurosciences Cognitives, CNRS Marseille, France, December 1992

31. The problem of coordination in movement and perception (talk). Max-Planck-Institut für psychologische Forschung, Munich, Germany, January 1993
32. The problem of coordination in action and perception: The dynamic approach in theory and experiment (talk). Faculty of Human Movement Science, Amsterdam, The Netherlands, February 1993
33. Concepts for a dynamic theory of perceptual organization (talk). International Symposium on Perceptual Multistability and Semantic Ambiguity, University of Bremen, Germany, March 1993
34. Dynamical systems as tools for system integration: From nervous systems to robotics (talk). Center for Informatics and Applied Mathematics (CIUP), Universidade do Porto, Portugal, March 1993.
35. Coordination: Movement and Action-Perception Patterns (talk). Laboratoire Vision et Motricité, INSERM Unité 94, Lyon-Bron, France, April 1993
36. Dynamics in Action and Perception (talk). Laboratoire de Physiologie Neurosensorielle, CNRS, Paris, France, April 1993
37. Dynamic approaches to problems in biological movement and perception, and their application to technical problems in system integration (talk). Department of Electronics and Telecommunications, Universidade de Aveiro, Portugal, May 1993.
38. Dynamics in the theory of movement (talk). Institut für Sportpädagogik, Technische Universität München, Germany, September 1993
39. Theory of dynamic systems: Are there generic features of rhythmic behavior in animals and humans (talk). Conference at ZiF Bielefeld on “Pre-rational intelligence: phenomenology of complexity emerging in systems of agents interacting using simple rules”, Germany, November 1993
40. Dynamic field theory of motor programming (talk). Conference at ZiF Bielefeld on “Pre-rational intelligence: biological systems”, February 1994
41. Biologische Bewegung (talk). Kolloquium des Zentrums für Interdisziplinäre Forschung, Universität Bielefeld, Germany, February 1994
42. Dynamic field architecture for autonomous robot navigation (talk). Colloquium of the Department for Biophysics and Medical Physics, Catholic University of Nijmegen, Nijmegen, The Netherlands, February 1994
43. Dynamic fields theory of motor programming (talk). Cognitive Science Program, Department of Psychology, Indiana University, Bloomington IN, U.S.A., May 1994
44. Dynamic approaches in motor control studies (talk). Chicago Motor Behavior Club, Rush-Presbyterian St. Luke’s Medical Center, Chicago IL, U.S.A., May 1994

45. Pattern formation, coordination, and dynamics (lecture). NASPSPA Pre-conference workshop on complex systems. Tampa, Florida, U.S.A., June 1994
46. Recent developments and problems in human movement science and their conceptual implications. Target lecture at the Third European Workshop on Ecological Psychology, Borken, Germany, July 1994
47. The dynamic account of coordination: Discrete versus rhythmic movement (talk). Third European Workshop on Ecological Psychology, Borken, Germany, July 1994
48. Cooperativity in the categorical perception of speech: experiment and modelling (poster, jointly with S.L. Castro, M.F. Barbosa, E. Bicho). European Society for Cognitive Psychology, Lisbon, September 1994.
49. The dynamic approach toward understanding nervous systems. Invited talk at the conference "The dynamic approach to autonomous robotics" San Sebastian, Spain, December 1994.
50. Neural Dynamic Field Architectures for Behavior-based Robots (talk). Neuroinformatics Colloquium, University of Zürich and ETH, Zürich, Switzerland, April 1995.
51. Dynamic Approach toward Action-Perception Problems. Séminaire du group "Posture, Equilibre et Mouvement", CNRS Marseille, April 1995.
52. Dynamic neural field theory of motor programming (talk). Colloquium, Department of Kinesiology, University of Maryland, College Park, MD, U.S.A., May 1995
53. Invited discussant at the workshop "Object Retrieval in Infants: A Window on Acting and Knowing", Neurosciences Institute, La Jolla, CA, U.S.A., May 1995
54. The dynamic approach to autonomous robotics. Lecture series (7 hours) given at the Workshop on the Practice and Future of Autonomous Agents, Monte Verita, Switzerland, September 1995
55. The dynamic neural field theory of perceptual organization. Invited talk at the Workshop on Intentional and Perceptual Dynamics, Graduate Research Institute for Experimental Psychology, Amsterdam, October 1995
56. Identification of nonlinear state space dynamics of the action-perception cycle for visually guided postural sway. Biomechanics and Motor Behavior Laboratory, HHP, University of Maryland, College Park, Feb. 1996
57. Dynamic Neural Field Theory of Motor Programming. Graduate Program Colloquium, Department of Exercise and Sport Science, CHHD, The Pennsylvania State University, University Park, Pennsylvania, Feb, 1996
58. Identification of nonlinear state space dynamics: postural sway is an active process. The Penn State Action Club, The Pennsylvania State University, University Park, Pennsylvania, Feb, 1996

59. Lecture series at the Institute for Research in Cognitive Science:  
"Dynamic approach to autonomous robotics";  
"Designing robot behaviors by attractor dynamics: an elementary example from obstacle avoidance";  
"Designing representations for autonomous robots by attractor dynamics: an elementary example from navigation"  
University of Pennsylvania, Philadelphia, USA, Feb 1996.
60. "Dynamic approach to human motor control", Department of Psychology, University of Pennsylvania, Philadelphia, USA, Feb 1996.
61. "Multi-sensorische Integration beim menschlichen Gleichgewichtsverhalten: Identifikation der Systemdynamik". Neurologisch-neurphysiologisches Colloquium, Klinikum der Albert-Ludwigs-Universität Freiburg, Germany, June 1996.
62. Discussant of the symposium on "Learning and unlearning in behavioral development" at the congress "The growing mind" commemorating the centennial of Jean Piaget's birth. Geneva, Sept. 1996.
63. "The dynamic neural field theory of motor programming and its relationship to population activity in motor cortex". KOGNET workshop on "Neural Coding", Ruhr-Universität Bochum, Germany, Sept. 1996
64. "The Dynamic Neural Field Theory of Motor Programming and its Relationship to Population Activity in Motor Cortex". Invited talk at the Satellite Symposium on Dynamical Neuroscience at the 22nd Annual Meeting of the Society for Neuroscience, Washington D.C., U.S.A., Nov. 1996
65. "The dynamic approach to autonomous robotics: "well-behaved" vehicles". Nonlinear dynamics seminar of the Institute for Physical Science and Technology, University of Maryland, Collega Park, U.S.A., Nov. 1996.
66. "A dynamic neural field model of the A not B effect". Academy Colloquium on "Non-linear analyses of developmental processes", Koninklijke Nederlandse Akademie van Wetenschappen, Amsterdam, Netherlands, Jan. 1997
67. "Dynamic neural field theory of motor programming". Fourth Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, U.S.A., March 1997
68. "Die dynamische Feldtheorie der Motorprogrammierung und der Motorkortex". Kolloquium des Fachbereichs Physik/Elektrotechnik, Universität Bremen, Bremen, Germany, April 1997
69. "Linking motor programming to cortical neurophysiology: The dynamic neural field theory of motor programming and multi-electrode recordings of population activity in motor cortex". Conference in hommage to Jean Requin on "Neural Substrates of Cognitive Processes", CNRS Marseille, France, May 1997
70. "Identifying the state space dynamics underlying postural control: Evidence for active postural sway". ISPG97: Multisensory control of Postural and Gait, Paris, June 1997

71. "Estimating neural fields from populations of neurons in motor cortex: Experiment and dynamic field theory". Second International Tamagawa Brain Forum, Bochum, Germany, October 1997
72. "The dynamic field theory of motor programming", Colloquium of the Department of Kinesiology, University of Maryland, College Park, MD, U.S.A., January 1998
73. "The dynamic field theory of motor programming", Colloquium of the Department of Psychology, Ohio State University, Columbus, Ohio, U.S.A., February 1998
74. "La perception du mouvement apparent et l'approche dynamique", Journées dynamiques des mécanismes de perception et reconnaissances des formes, Cogniseine, ENST, Paris, March 1998
75. Moderator of group "Emergence" at the Dählem conference on Natural Organisms, Artificial Organisms, and Their Brains, ZiF Bielefeld, Germany, March 1998
76. "A dinâmica das representações motoras: o conceito unificador de campo dinâmico". III-Encontro Brasileiro Internacional de Ciência Cognitiva. Campinas, São Paulo, Brazil, April 1998
77. "L'approche dynamique pour la robotique autonome". IXèmes Journées neurosciences et sciences de l'ingénieur, Munster, Alsace, France, Mai 1998
78. "Controlling some degrees of freedom more than others" (poster presentation). Jacques Monod Conference on Plasticity and Adaptation in Motor Control. Aussois, France, Sept. 1998
79. "Ideen aus dem dynamischen Zugang zur Untersuchung der Vorbereitung und Regelung von Willkürbewegungen: Attraktoren und das dynamische Feld". Workshop "Wille und Tat", Max-Planck-Institut für psychologische Forschung, Jan. 1999
80. "The dynamic field and its preshaping: Concepts toward a general theoretical framework of embodied cognition" Workshop on: Embodied Cognition and Development. Electrotechnical Laboratory, Ministry of International Trade and Industry, Tsukuba, Japan, Feb. 7-14, 1999
81. "The dynamic approach toward autonomous robotics", ATR Human Information Processing Research Laboratories Kyoto, Japan, Feb. 15, 1999
82. "The dynamic field theory: A dynamic systems framework for understanding human (embodied) cognition". Talk at the 1999 Biannual Meeting of the Society for Research in Child Development (SRCDD 99), Albuquerque, New Mexico, USA, April 1999
83. "A dynamical systems robot model of infant perseverative reaching". Cognitive Science Colloquium, Indiana University, Bloomington, Indiana, USA, May 1999

84. "The dynamic approach to movement, perception, and representation", Seminar series at the Department of Psychology, University of Iowa, Iowa City, June 1999
85. "Different theoretical approaches to timing", Invited discussant at the workshop on Timing, Universität Potsdam/Deutsche Forschungsgemeinschaft, Potsdam, Germany, Oct. 1999
86. "Dynamische Repräsentationen: Der Zugang der qualitativen Dynamik zum Verständnis metrischer Repräsentationen in Nervensystemen", Kognet Kolloquium, Ruhr-Universität Bochum, Germany, November 1999
87. "The dynamic systems approach to action, perception, and cognition". Lecture series (9 hours), Cognitive Science, Brown University, Providence, USA, February 2000
88. "What are the fundamental, conceptually challenging problems for understanding multi-sensory fusion?". Invited talk at the 2nd Annual Multisensory Research Conference, International Multisensory Research Forum, Tarrytown, New York, USA, October 2000
89. "Using Attractor Dynamics to Generate Autonomous Robot Behavior". The Control and Dynamical Systems Invited Lecture Series of the Institute for Systems Research, University of Maryland, College Park, Maryland, USA, October 2000
90. "Using Attractor Dynamics to Generate Behavior and Represent Information: Conceptual Issues and Applications to Autonomous Robotics". Computer Science Colloquium, Indiana University, Bloomington IN, USA, November 2000
91. "Dynamic field theory". SRCD'2001, Minneapolis, USA, April 2001
92. "Dynamical systems approaches to understanding the generation of movement by the nervous system". Progress in Motor Control III. Montréal, Canada, August 2001
93. "Time as the substrate of behavioral and neural processes: dynamical systems approaches", École: La temporalité dans les sciences cognitives, Roscoff, France, Oct 2001
94. "Dynamic field theory of spatial working memory". Forschungskolloquium Biopsychologie, Ruhr-Universität Bochum, Germany, December 2001
95. "Selbstorganisationsprinzipien und ihre mögliche Rolle bei der Organisation von Bewegungen", workshop "Prinzipien menschlicher Bewegungssteuerung". Ohlstadt, Germany, January 2002
96. "Dynamic field theory and embodied cognition". Kolloquium Psychologie, Universität Potsdam, Germany, April 2002
97. "Stability and instability in the generation of movement". Coordination Dynamics, Boca Raton, Florida, USA, May 2002

98. “Bewegungsplanung in Nervensystemen und in autonomen Robotern auf der Basis dynamischer Systeme”. Kolloquium Physik, Philipps-Universität Marburg, Germany, June 2002
99. “Dynamic field theory of embodied cognition: A developmental perspective”. Gemeinsames Forschungs-Kolloquium des Max-Planck-Instituts für Psychologische Forschung und der Allgemeinen und Experimentellen Psychologie der LMU, Munich, Germany, October 2002
100. “The uncontrolled manifold concept to determine the structure of the control system governing human voluntary movement”, Workshop SFB 475 on Reduction of Complexity — Necessity, Trade-Offs, Methods”. Dortmund, November 2002
101. “Dynamic field theory and embodied cognition”, Colloquium at the Max-Planck Institute for Mathematics in the Natural Sciences, Leipzig, Germany, February 2003
102. “Dynamic field theory and embodied cognition”, Invited talk at AISB’2003 Cognition in Machines & Animals, Aberystwyth, UK, April, 2003
103. “Dynamic field theory and embodied cognition”, Colloquium, NICI, Universiteit Nijmegen, The Netherlands, May 2003
104. “Dynamic field theory and embodied cognition”, Kolloquium, Kognitionswissenschaften, Universität Oldenburg, May, 2003
105. “Dynamic field theory of embodied cognition: a developmental perspective” (invited talk), Progress in Motor Control IV, Caen, France, August 2003
106. “An attractor dynamics account for the uncontrolled manifold”, International Society of Posture & Gait Research, 3rd Posture Symposium at Smolenice Castle, Slovakia, September 2003
107. “Handlungsplanung in künstlichen und natürlichen Nervensystemen: der theoretischen Ansatz der neuronalen dynamischen Felder”, Physikalisches Kolloquium, Ruhr-Universität Bochum, Germany, November 2003
108. “Toward a Dynamic Field Theory of Embodied Cognition — representing metric information for action, perception, and cognition”. IGSN Symposium, Bochum, Germany, February 2004
109. “Denken Maschinen? Von der “Freiheit” der Roboter”. Studium Generale, Ruhr-Universität Bochum, Germany, February 2004
110. “Toward a Dynamic Field Theory of Embodied Cognition: representing metric information for action, perception, and cognition”, Fakultät für Sportwissenschaften, Technische Universität München, Germany, May 2004
111. “The uncontrolled manifold”, Colloquium of the Faculty for Movement Science, Free University Amsterdam, The Netherlands, June 2004

112. "Toward a Dynamic Field Theory of Embodied Cognition: representing metric information for action, perception, and cognition", Colloquium, Program in Cognitive Science, Department of Computer Science, EPFL Lausanne, Switzerland, June 2004
113. "Dynamic Field Theory of Decision making", Institut de Neurosciences Cognitives de la Méditerranée, Marseille, France, June 2004
114. "Understanding the activation dynamics of habituation changes the questions asked about the perceptual representations of infants", SCRC 2005, Atlanta, USA, April 2005
115. "Repensando la habituación infantil desde la perspectiva dinámica de la cognición", Kolloquium Universidad Autónoma de Madrid, Madrid, Spain, May 2005
116. "Dynamical systems thinking: What does it do for understanding movement?" European Workshop on Movement Science, Vienna, Austria, June 2005
117. "Development as Change of System Dynamics: Stability, Instability, and Emergence". Connectionist & Dynamic Systems Approaches to Development, Iowa City IA, USA, June 2005
118. "Dynamic Field Theory as a framework for understanding Embodied Cognition" Kognitionswissenschaftliches Kolloquium, Universität Bonn, Bonn, Germany, June 2005
119. "Attractors and their instabilities as the basis of embodied cognition: from nervous systems to autonomous robots". Neuromorphic Workshop Telluride 2005, Telluride CO, USA, July 2005
120. "Dynamic Field Theory as a framework for understanding Embodied Cognition". Opening Conference Embodied Cognition I. Zentrum für Interdisziplinäre Forschung, Universität Bielefeld, Bielefeld, Germany, October 2005
121. "Dynamic Field Theory as a framework for understanding Embodied Cognition", Colloquium of the Department of Psychology, University of Iowa, Iowa City IA, USA, October 2005
122. "Dynamic Field Theory as a Framework for Understanding Embodied Cognition", Kolloquium Kognitionswissenschaften, Universität Bremen, Bremen, Germany, November 2005
123. "Dynamic Field Theory as a framework for understanding Embodied Cognition" Centro de Ciência Cognitiva da Universidade do Porto, Porto, Portugal, March 2006
124. "Dynamic Field Theory as a Framework for Understanding Embodied Cognition", Colloquium of the Institut für Neuroinformatik, ETH Zürich-Universität Zürich, Switzerland, April 2006



125. “Dynamic Field Theory: Conceptual Foundations”, International Conference on Development and Learning ICDL’2006, Bloomington, Indiana, USA, June 2006
126. “Dynamic Field Theory: A tutorial on strongly interacting neural fields, how they account for embodied cognition, and how they can be used in autonomous robotics”, Neuromorphic workshop, Telluride, Colorado, USA, July 2006
127. “Dynamic Field Theory: using behavioral evidence to identify strongly interacting neural fields”, Computational Neuroscience CNS 2006, Edingburgh, UK, July 2006
128. “Developing embodied cognition: Dynamic Field Theory and its application to experiment and robotics”, Keynote lecture, Epirob 2006, Paris, September 2006
129. “What can we learn from where infants look? Dynamic field theory of the process of habituation”, Colloquium Department of Psychology, University of Iowa, Iowa City, USA, October 2006
130. “Über Bewegungsvorbereitung”, Sportwissenschaft in der Entwicklung, Siemens-Stiftung, München, October 2006
131. “Dynamical Field Theory as a framework for embodied cognition”, Seminaires du Centre de Neurosciences des Saints Pères, Paris, November 2006
132. “Dynamic field theory: How stable behavior and embodied cognition emerge from continuous space-time neuronal dynamics”, Neural Information Processing Systems NIPS 2006, Whistler, Canada, December 2006
133. “Dynamical Field Theory”, invited lecture at the EU Cognition workshop: Embodying cognition: towards an integrative approach?, Palma de Mallorca, Spain, December 2006
134. “Dynamic Field Theory as a framework for understanding embodied cognition”, Cognitive Lunch, Cognitive Science Program, Indiana University, Bloomington IN, USA, January 2007
135. “A dynamical systems account of the Uncontrolled Manifold: Redundancy, Self-motion, and Stability”, Department of Biophysics, Radboud University Nijmegen, The Netherlands, February 2007
136. “Theoretical Perspectives on Learning”, Interdisziplinäres Kolleg, Günne, Germany, March 2007
137. “Behavior, cognition, neural dynamics”, Neuromorphic Workshop, Alghero, Sardinia, Italy, April 2007
138. “Understanding the structure of stability: Theory of the uncontrolled manifold”, Progress in Motor Control VI, Santos, Brazil, August 2007

139. "How Cognition Emerges: The Framework of Dynamic Field Theory", Dynamical Approaches to Development: Beyond the Metaphor. Workshop at the 9th European Conference on Artificial Life, Lisbon, Portugal, September 2007
140. "Redondance, le mouvement interieur, l'équivalence moteur et la Variété Instable", Colloquium LAPMA - UFR STAPS, Université Paul Sabatier, Toulouse, France, September 2007
141. "Multi-degree of freedom motor control: Self-motion, motor equivalence and the Uncontrolled Manifold", Colloquium LASA, Ecole Polytechnique Fédérale de Lausanne EPFL, Switzerland, October 2007
142. "Dynamic Field Theory as the interface between neuronal dynamics and embodied cognition", Keynote address at the International Conference on Computational Neuroscience ICCN'2007, Shanghai, China, November 2007
143. "Dynamic Field Theory as a framework for understanding embodied cognition", invited lecture at the 14th Herbstakademie "Theory in Cognitive Neuroscience", Wildbad Kreuth, Germany, November 2007
144. "Dynamic Field Theory", lecture series at the Interdisziplinäres Kolleg IK2008, Günne, Germany, March 2008
145. "The dynamics of infant habituation". XVIth International Conference on Infant Studies (ICIS), Vancouver, March 2008
146. "Dynamic neural fields as a cognitive architecture". Alghero, Sardinia, April 2008
147. "Dynamic Field Theory: A Primer". One-week summer school directed jointly with Dr. John Spencer at the University of Iowa, Iowa City, IA USA, May 2008
148. "Moving embodied and situated cognition upwards using Dynamic Field Theory". Neuromorphic Workshop, Telluride CO, July 2008
149. "Dynamic Field Theory One-Day Workshop". Cognitive Science 2008, Washington, July 2008
150. "Dynamic Field Theory as a conceptual framework for understanding embodied cognition". Dynamics and Applications, Conference in Honour of Maricio Peixoto and David Rand. Braga, Portugal, September 2008
151. "Dynamical Field Theory as a neuronally grounded framework for understanding cognition". NeuroComp 2008, Marseille, France, October 2008
152. "Dynamic Field Theory as a framework for understanding embodied cognition and a basis for human factors modeling". CHALMERS Research Center, Göteborg, Sweden, December 2008
153. "Neural principles of movement generation". International Seminar on Speech Production 2008, Strasbourg, France, December 2008

154. “Dynamical systems: a tutorial with an eye to timing and cognition”. Lecture series at the Interdisziplinäres Kolleg IK2009, Günne, Germany, March 2009
155. “What is holding us back on our way to cognition?” The 2009 Capo Caccia Cognitive Neuromorphic Engineering Workshop, Alghero, Sardinia, April-May 2009
156. “Dynamic Field Theory”. Lecture series at the Dynamic Field Theory Summer School, University of Iowa, Iowa City, USA, June 2009
157. “Perception of visual motion: basic concepts and the counter-change mechanism”. Neuromorphic workshop INE Telluride, Colorado, USA, July 2009
158. “Dynamic Field Theory”. Lecture series at Cognitive Science 2009, Amsterdam, The Netherlands, July 2009
159. “Swarm cognition: analogies with pattern formation and neuronal dynamics and their limitations”. Cognitive Science 2009, Amsterdam, The Netherlands, July 2009
160. “How do neuroscientific insights impact on our approach to life? Emergence vs. mechanistic determinism”. Decode of the Mind V Meeting in Berlín, Germany, September 2009
161. “Can a new AI become a formal science?”, Eu Cognition II First Annual Meeting, Hamburg, Germany, October 2009
162. “Understanding the context dependent emergence of cognition in terms of neuronal mechanisms”, Workshop “Extended Mind”, Zentrum für Interdisziplinäre Forschung, Universität Bielefeld, Germany, November 2009
163. “Dynamic Field Theory: a mathematical and conceptual primer”. Faculty of Psychology, University of Gent, Belgium, April 2010
164. “Coordinating many degrees of freedom: The conceptual foundations of the uncontrolled manifold.”, Fondazione Santa Lucia, Rome, Italy, May 2010
165. “Dynamic Field Theory: A tutorial”. Lecture series at the “Dynamic Field Theory Summer School”, University of Iowa, Iowa City, USA, June 2010
166. “Dynamic Field Theory: Conceptual Foundations and Applications in the Cognitive and Developmental Sciences”, 1-Day Tutorial at Cognitive Science 2010, Portland, USA, August 2010
167. “The uncontrolled manifold concept and its underlying mechanisms.”. Invited talk at the 3rd International Congress Complex Systems in Medicine and Sport - ICCSMS 2010, Kaunas, Lithuania, September, 2010
168. “Dynamic Field Theory: A tutorial”, Lecture series at the Fall School of the EU Cognition II Network on “Neural Dynamics Approaches to Cognitive Robotics”, Bochum, Germany, September 2010

169. “Dynamic Field Theory as a framework for understanding embodied cognition”, Plenary talk at ABiALS 2010/11: Spatial Representations and Dynamic Interaction, ZiF Bielefeld, Germany, February 2011.
170. “Models of Decision Making”, Lecture series at the Spring School IK 2011, March, 2011 Günne, Germany.
171. “Putting representation back into embodied cognition: Dynamical Field Theory”. Plenary lecture at the Member meeting of the EU Cognition II network, Thessaloniki, Greece, April 2011.
172. “Neurally grounding Embodied Cognition through Dynamic Field Theory”, Colloquium of the BCCN/GRK/MCN at the Ludwig-Maximilian University Munich, May 2011, Munich, Germany
173. “From Nonlinear Dynamics to Cognition”, Colloquium at the Ecole des Aires, Salons de Provence, France, June 2011
174. “Toward an integrated neural dynamics account of movement generation”, Keynote lecture at Progress in Motor Control VIII, July 2011, Cincinnati, OH, USA
175. “Dynamic Field Theory : A tutorial”, Lecture series at the Fall School of the EU Cognition II Network on “Neural Dynamics Approaches to Cognitive Robotics”, Guimarães, Portugal, September 2011
176. “Dynamical Systems Thinking: from metaphor to neural theory”, Invited lecture at the Conference on Inductive Developmental Systems Theory, The Pennsylvania State University, University Park, PA, USA October 2011.
177. “Autonomy in organisms and artificial agents: the principle of stability”. EU Cognition II Network meeting, Groningen, The Netherlands, Oct 2011
178. “Dynamic Field Theory as a Framework for Neurally Grounded Cognitive Architectures”. Talk at the workshop on “Mathematical Models of Cognitive Architectures”, CIRM, Marseille, France, Dec 2011
179. “A neuro-dynamic framework for cognitive robotics: scene representations, behavioural sequences, and learning”. Talk at CogSys 2012, 5th International Conference on Cognitive Systems, Vienna, Austria, Feb 2012
180. “Dynamic Field Theory”. One day tutorial given at Spring School “Human Modelling”, BCCN/LMU, Munich, Germany, Mar 2012
181. “Dynamic Field Theory as a Framework for Understanding Embodied Cognition”. Talk at the workshop on “Cognitive dynamics in neural systems: mathematical and computational modeling”. Lyon, France, Mar 2012
182. “Dynamic Field Theory as a language to understand Embodied Cognition”. Talk at the 2nd International Conference on Neural Field Theory, University of Reading, Reading, UK, Apr 2012

183. "Development as autonomous learning: Emergence of developmental stages that lead from sensori-motor behaviors to embodied cognition". Symposium on Autonomous Learning of the DFG SPP 1529, Berlin, Germany, Apr 2012.
184. "Movement preparation, generation, and control: A synthesis." Lecture at the Motor Control Summer School IX, Tihany, Hungary, June 2012
185. "Toward an integrated neural dynamics account of movement generation". Invited lecture at the "VI Congresso Brasileiro de Comportamento Motor", São Paulo SP, Brazil, July 2012.
186. "Dynamic Field Theory as a mathematical framework for understanding embodied cognition". Keynote lecture at the 45th Annual Meeting of the Society for Mathematical Psychology, Columbus, OH, USA, July 2012
187. "Neural Dynamics for autonomous robots", One day tutorial at the SAB Workshop 2012 "From Animals to Animats" Odense, Denmark, Aug 2012
188. "Dynamic Field Theory as a mathematical framework for understanding embodied cognition", Kolloquium Institut für Kognitionswissenschaften, Universität Onsbrück, Germany, Dec 2012
189. "Dynamic Field Theory as a mathematical framework for understanding embodied cognition". Colloquium at the Center for Complex Systems, Florida Atlantic University, Boca Raton, FL, USA, Feb 2013
190. "Human dexterity and cognitive robotics: How may neural dynamic principles inform the design of autonomous robots?". Workshop on Grasping at the International Conference on Robotics and Automation (ICRA), Karlsruhe, Germany, May 2013.
191. "A Neural Architecture to Ground Spatial Language Based on Dynamic Field Theory." Workshop on Spatial memory: Bayes and beyond. University of Richmond, VA, USA, May 2013
192. "Redundancy, abundance, synergies: Are these just words?" Motor Control Summer School, Antiochia, PA, USA, July 2013
193. "Dynamic Field Theory", 1 day workshop at 35th Annual Cognitive Science Conference, Berlin, Aug 2013
194. "Toward an integrated neural dynamics account of movement generation". Colloquium of the Faculté des Sciences du Sport et du Mouvement Humain, Université Toulouse III Paul Sabatier. Sep 2013
195. "Ein Roboter in jedem Haus?" Leben mit der Technik von morgen. Veranstaltung der Stiftung Volkswagenwerk. Hannover, Germany, Nov 2013.
196. "How may neural dynamic principles inform the design of autonomous robots?" Biomedical Engineering, Temple University, Philadelphia, Feb 2014
197. "Redundancy, abundance, synergies, and the uncontrolled manifold". Department of Kinesiology, Temple University, Philadelphia, Feb 2014

198. “Human dexterity and cognitive robotics: How may neural dynamic principles inform the design of autonomous robots?” Action Club at the Department of Kinesiology, Penn State University, State College, PA, USA, Mar 2014
199. “Redundancy, abundance, synergies, and the uncontrolled manifold” Department of Kinesiology, Penn State University, State College, PA, USA, Mar 2014
200. “Neural Dynamics”. European Robotics Forum 2014, Roverto, Italy, Mar 2014
201. “Synergy vs. uncontrolled manifold: a theoretical analysis clarifies the tension between the two concepts”. Motor Control Summer School, Bled, Slovenia, Jun 2014
202. “Dynamical Systems Thinking: from metaphor to neural theory.” ICIS 2014 Pre-conference workshop on Computational Models of Infant Development. Berlin, July 2014
203. “Embodied Cognition” (lecture course). Summer school in Cognitive Science, Sofia, Bulgaria, July 2014
204. “Neural Dynamics for Higher Cognition...”. Neuromorphic Cognition Workshop, Telluride, CO, USA, July 2014
205. “Dynamic Field Theory: From the sensory-motor domain to embodied higher cognition.” KogWiss Konferenz der Gesellschaft fr Kognitionswissenschaften, Tübingen, Germany, Sept 2014
206. “Elementary behaviors (or movement primitives) in voluntary movement”. Department of Kinesiology, Temple University, Philadelphia, Nov. 2014
207. “Roboter in unserer Lebenswelt? ” Blue-Square public lecture, 50 Jahre Ruhr-Universität, Bochum, Germany, April 2015
208. “How to make a movement oriented at an object: Toward a neural dynamic account of all the processes involved ”. Workshop “Towards a Theoretical Physics of Human Movement” at Universit’e Sud de Paris, Campus d’Orsay, July 2015
209. “The dynamical systems metaphor of development and how it may inform autonomous learning.” Robotics Systems Science, Rome, July 2015
210. “Toward an integrated neural dynamic account of object-oriented movement” . Progress in Motor Control X, Budapest, Hungary, July 2015
211. “What might an integrated neural processing account for object-oriented movement look like?”, Department for Kinesiology, Temple University, Philadelphia, USA, Sep 2015
212. “Toward an integrated neural processing account for object- oriented movement: principles from human movement science, theory, and robotic demonstration”, International Conference on System Level Approaches to Neural Engineering (ICSLANE), Barcelona, Sep 2015

213. “From the sensory-motor domain to the perceptual grounding of language: A neural dynamic process account. ” Kolloquium Psychologie, Universität Giessen, Germany, Oct 2015
214. “Intentional agents: A neural process account reflects the logical structure of intentionality”, John R Searle Lectures on Perception, workshop, Ruhr-Universität Bochum, Germany, May 2016
215. “Embodied cognition” and “Toward higher cognition”. Lectures at the Dynamic Field Theory Summerschool organized by John Spencer at the University of East Anglia, Norwich, England, Jun 2016
216. “Equilibrium point theory, the N-shape, and optimal control: a model and a conceptual discussion”. Lecture at the Motor Control Summer School - XIII, Tzuba Hotel, Israel, Jun 2016
217. “Autonome kognitive Systeme”. Vortrag auf der Veranstaltung “Das Erwachen der Maschinen” der Bischöflichen Akademie des Bistums Aachen, Oct. 2016
218. “Cognition in embodied and situated nervous systems. Lecture 1: Foundations” and “Lecture 2: toward higher cognition”, BioComp Summer School 2017, Roscoff, France, Jun 2017
219. “Toward an integrated neural dynamic approach of object-oriented movement”. Lecture at the Motor Control Summer School in Florianópolis, SP, Brazil, Jul 2017