Prof. Dr. Gregor Schöner August 15, 2018

**Curriculum Vitae**

## 1 Personal data


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| Name: | Prof. Dr. Gregor Schöner |
| Birthdate: | May 27, 1958, Sindelfingen, West Germany |
| Office address | Institut für Neuroinformatik NB3/31<br>Ruhr-Universität Bochum<br>Universitätsstr. 150<br>44801 Bochum<br>Germany<br>tel: +49-234-322-7965<br>fax: +49-234-321-4209<br>email: `Gregor.Schoner@ini.rub.de` |
| Home address | Uhlandstr. 92<br>44791 Bochum, Germany |


## 2 Education

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|---|---|
| 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

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| 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, US.A., April – June 1994

Fellow at the ZiF (Center for Interdisciplinary Tesearch) 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*, *Minverva 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 beahvioral, 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 hommage to Jean Requin on "Neural Substrates of Cognitive Processes", CNRS Marseille, France, May 1997 (member of organizing commitee)

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 Robotersteurung 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 Gepperth: "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 Fuball", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, September 2014

27. Britta Grimme: "Nachweis und Analyse elementarer Invarianten als Bausteine menschlicher Armbewegungen", Fakultät für Biologie und Biotechnologie, Ruhr-Universität Bochum, Germany, September 2014

28. 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

29. Sebastian Noth: "A Multi-User Driving Simulator for Studying Human Driving", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, November 2014

30. Joe Norman: "A theory for the visual perception of object motion", Department of Psychology, Florida Atlantic University, Boca Raton, FL, USA, Dec 2014 (co-adviser with Prof. Howard Hock)

31. Sebastian Schneegans: "Dynamic Field Theory of Visuospatial Cognition", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, Mach 2015

32. Sebastian Houben: "Bildverarbeitende Algorithmen zur Fahrerassistenz mit Weitwinkelkameras", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, November 2015

33. Stephan Zibner: "A Neuro-Dynamic Architecture for Autonomous Visual Scene Representation", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, June 2016

34. Oliver Lomp: "Object recognition in dynamic field theory", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, June 2017

35. Claudius Strub: "A Neurodynamic Model for Haptic Spatiotemporal Integration" Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, June 2017

36. Eva Hansen: "Koartikulation bei menschlichen Armbewegungen", Fakultät für Biologie und Biotechnologie, Ruhr-Universität Bochum, Germany, September 2017

37. Andre Ibisch: "Künstliche Wahrnehmung auf Basis ortsfester Sensoren". Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, Oktober 2017

38. Mathis M Richter: "A neural dynamic model for the perceptual grounding of spatial and movement relations". Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, June 2018

39. Marc P Tschentscher: "Sensorbasiertes Parkleitsystem mit Umfelderfassung zur Navigation und Belegungserkennung einzelner Parkplätze", Fakultät für Elektrotechnik und Informationstechnik, Ruhr-Universität Bochum, Germany, August 2018

## 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 Cognitique, 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 withC 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

33. "An experimental-computational approach to the integration of subtasks with a spinal reflex model of locomotion". Collaborative US-German grant proposal in the CRCNS (Collaborative Research in Computational Neuroscience) program with Prof. John Jeka at the University of Delaware. Starting in 2018.

## 9 Industry research projects

1. HONDA Research Europe GmbH, duration: 01.09.2002 - 28.02.2003;

2. "INVENT - Fahrerwunscherkennung für FAS Entwicklungsarbeiten"; Audi AG; duration: Dec.2001 - Feb 2003;

3. AUDI AG; duration: Dec 2002 - 31.01.2003;

4. "Invent", SIEMENS VDO Automotive; duration: 2002 - 2005;

5. BOSCH GmbH; duration: 01.11.2003 - 31.10.2004;

6. HONDA Research Europe GmbH; duration: 01.09.2003 - 28.02.2004;

7. BMW AG; duration: 20.04.2004 - 31.03.2005;

8. Nokia Research Center Bochumm GmbH, duration: 1.7.-31.12.2007;

9. Bosch GmbH, duration: 2007-2009;

10. Continental AG, duration: 2008-2009;

11. Continental AG (US); duration: Feb - Oct 2012;

12. Volkswagen AG, duration: 2011 - 2012;
13. Audi Electronic Venture (AEV), duration: Nov 2011 - Mar 2012;
14. ADC GmbH, duration: Mar 2011 - Mar 2012;
15. Volkswagen AG, duration: May 2012 - Apr 2014
16. Volkswagen AG, duration: Aug - Dec 2012;
17. Continental AG, duration: Jul 2012 - Jan 2013;
18. Audi AG, duration: Aug 2012 - Mar 2013;
19. ADC GmbH, duration: Jul 2012 - Dec 2012
20. ADC GmbH, duration: Sep 2012 - Dec 2012
21. Deutsche Fussball Liga Digital, duration: Jan - Apr 2013;
22. Continental AG, duration: May 2013 - Apr 2014;
23. Continental AG ,duration: May - Nov 2013;
24. Audi AG, duration: May - Dec 2013;
25. Audi AG, duration: Oct 2013 - Mar 2014;
26. Audi AG, duration: Nov 2014 - Aug 2015;
27. Audi AG, duration: Sep 2015 - Jun 2016;

## 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)

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## 11 Talks (selection)

1. Stochastische Theorie eine 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", Coorganizers: 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 Preconference workshop on complex systems. Tampa, Florida, U.S.A., June 1994

46. Recent developments and problems in human movement science and their conceptualimplications. 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 ming" 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 Adakemie 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/Elektotechnik, 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 Dahlem conference on Natural Organisms, Artificial Organisms, and Their Brains, ZiF Bielefeld, Germany, Mach 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". IXm̀ees 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 (SRCD 99), Albuquerque, New Mexico, USA, April 1999

83. "A dynamical systems robot model of infant perserverative 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, Universtität Potsdam/Deutsche Forschungsgemeinschaft, Potsdam, Germany, Oct. 1999

86. "Dynamische Reprs̈entationen: 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". Kolloqium 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". Kolloqium Physik, Phillipps-Universität Marburg, Germany, June 2002

99. "Dynamic field theory of embodied cognition: A developmental perspective". Gemeinsames Forschungs-Kolloquium des Max-Planck-Instituts fr 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, Aberysthwyth, 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 habituacin infantil desde la perspectiva dinmica de la cognición", Kolloquim Universidade Autonoma 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, Instabilty, 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 Kolloquim, 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 Fédéderale de Lausanne EPFL, Switzerland, October 2007

142. "Dynamic Field Theory as the interface between neuronal dynamcis 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 Berln, 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 Cognitionthrough 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 Comportamente 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 fr 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 Sciene 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". Departmenet 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". Departmenet 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, Universitt 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-Universitt 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 Erwarchen 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

220. "Coarticulation in naturalistic arm movements". Lecture at the GIPSA Lab of the CNRS, Grenoble-INP, and Univ. Grenoble-Alpes, Grenoble, France, Nov 2017

221. "What is entailed in making an object-oriented movement?". Lecture at the Department of Engineering Cybernetics Norwegian University of Science and Technology, Trondheim, Norway, Nov 2017

222. "Embodied cognition and development: How the sensory-motor origin of cognition provides constraints for a neural process account of cognition", Lecture at the Department of Psychology, University of Tennessee, Knoxville, USA, Dec 2017

223. "Embodied cognitive systems and Deep Learning: Conceptual overlaps and contrasts". Keynote lecture at the EU Cognition Conference 2017, Zrich, Dec 2017

224. "Embodied cognition does not necessarily engage the body, but cognitive processes share properties with sensory- motor processes", Lecture at the Symposium on Morphological and Embodied Computing. Chalmers Univ. of Technology, Gothenburg, Sweden, May 2018

225. "The degree of freedom problem, synergies, and the uncontrolled manifold." Lecture at the Tagung der Arbeitsgemeinschaft fr Sportpsychologie, Sporthochschule Köln, May 2018

226. "What processes must be in place to achieve arm movements oriented at objects?" Lecture at the XV Motor Control Summer School, Olomouc, Czech Republic, Jun 2018

227. "Dynamic Field Theory: Foundations, relation to development, and link to higher cognition". Keynote lecture at the conference "Expanding The Field: Multi-Disciplinary Developmental Dynamics", University of East Anglia, Norwhich, UK, Jun 2018

228. "A Neural Dynamic Architecture That Autonomously Builds Mental Models", Talk at the 40th Annual Meeting of the Cognitive Science Society, Madison WI, USA, Jul 2018

229. "Building embodied cognitive systems in neural dynamics". NSF M3X workshop on the dynamic interaction between embodied human and machine intelligence, Marconi Conference Center, Point Reyes, Marshall, CA, USA Aug 2018