

## CURRICULUM VITAE

Prof. Dr. Dr. phil. Dr. rer. nat. habil. Gustavo Deco

**Private :** Birth Date and Place: 07.11.1961 in Rosario (Argentina)  
Marital Status: Married and four sons  
Nationality: Italian

### Graduates Degrees:

03.79 - 03-83 Diploma in Theoretical Physics  
National University of Rosario

### Postgraduates Degrees :

04.84 - 06.87 Ph.D in Theoretical Physics.  
Ph.D thesis: Atomic Collision at Relativistic High Energies.  
National University of Rosario. Note: Summa cum Laude

12.96 Habilitation and PhD in Theoretical Computer Science (Dr. rer.nat. habil.)  
(Habilitation is the maximal academical degree in Germany and qualifies for a professorship)  
Postdoctoral thesis: Unsupervised Learning and Information Theory:  
Parametric and Nonparametric Formulation  
Technical University of Munich

05.97 - 07.01 Ph.D in Psychology (Neuropsychology, Dr. phil.).  
Ph.D thesis: "The Computational Neuroscience of Visual Attention"  
Ludwig-Maximilian-University of Munich. Note: Summa cum Laude.

### Research Activities :

04.84 – 03.88 Fellowship from the National Research Council at University of Rosario.

06.87 - 08.87 Post-Doctoral Fellowship at the University of Bordeaux (France)

05.88 - 12.89 Post-Doctoral Fellowship of the *Alexander von Humboldt-Foundation*  
University of Gießen (Germany)

01.90 - 06.92 Siemens AG, Unterschleißheim  
Real Time Expert Systems and Neural Networks (Spin Glass)

07.92 – 03.03 Siemens AG, Research Corporate  
Senior Principal Research Scientist  
Neural Networks and Computational Neuroscience

since 09.99 Honorary Professorship at the National University of Rosario

since 09.99 Privat-Dozent at the Technical University of Munich

since 02.01 McDonnell-Pew Visiting Fellow of the Centre for Cognitive Neuroscience of the  
University of Oxford

since 03.03 Research Professor by Institució Catalana de Recerca i Estudis Avançats (ICREA)  
at the University Pompeu Fabra.

since 03.08 Full Professor (Catedrático) at the University Pompeu Fabra.

**Publications:** (see list)

**Papers:**

International Reviews:	142
International Conferences:	239
Chapters in Books:	28

**Books:**

- 1) *"An Information-Theoretic Approach to Neural Computing"*  
G. Deco and D. Obradovic  
Springer Verlag,, New York 1996.
- 2) *"Information Dynamics: Foundations and Applications"*  
G. Deco and B. Schürmann  
Springer Verlag, New York, 2000.
- 3) *"Computational Neuroscience of Vision"*  
E. Rolls and G. Deco  
Oxford University Press, Oxford, 2001.
- 4) *"The Noisy Brain"*  
E. Rolls and G. Deco  
Oxford University Press, Oxford, 2010.

**Patents** (see list): 52

**Awards:** Inventor of the Year 2001 (Siemens world wide competition).

**Academical Activities :**

- 03.83-03.88 Teaching Assistent at the National University of Rosario.  
- Theoretical Mechanic (1983-1984)  
- Theoretical Electrodynamic (1985-1986)  
- Quantum mechanic (1987-1988)
- 04.1994 Invited Professor at the National University of Rosario.  
- Introduction to the Theory of Neural Networks.
- 1994-1995 Teaching Assistent at the University of Frankfurt  
- Introduction to the Theory of Neural Networks.  
- Informationdynamics
- since 1994 Privat-Dozent at the Technical University of Munich  
- Information Theory and Neural Network.  
- Informationdynamics.  
- Computational Neuroscience.
- 05.1997 Invited Professor at the National University of Rosario.  
- Theoretical Computer Science
- 10.2002 Invited Professor at the University Pompeu Fabra (Barcelona).  
- Introduction to Computational Neuroscience

- since 10.2001      Invited Lecturer at the Ludwig-Maximilians-University Munich.  
- Computational Neuroscience
- 2003-2008      Professor at the University Pompeu Fabra (Barcelona).  
Lectures:  
- Artificial Intelligence II (Undergraduates Courses)  
- Computational Neuroscience (PhD and Master Courses)  
- Biomathematics (Master in Bioinformatics, Biology-UPF)
- 2004-2006      Director of the Doctoral Program in Computer Science and Digital  
Communication at the University Pompeu Fabra (UPF, Barcelona).
- 2005      Invited Professor: Computational Neuroscience (PhD Course)  
- Karolinska Institute, Stockholm (Sweden)  
- Universidad La Laguna, Almería (Spain)
- 2006      Invited Professor: Computational Neuroscience (PhD Course)  
- Universidad La Laguna, Almería (Spain)
- 2007      Invited Professor: Computational Neuroscience (PhD Course)  
- Universidad La Laguna, Almería (Spain)  
- Karolinska Institute, Stockholm (Sweden)
- since 2008      Full Professor (Catedrático) at the University Pompeu Fabra (Barcelona).  
Lectures:  
- Artificial Intelligence II (Undergraduates Courses)  
- Computational Neuroscience (PhD and Master Courses)

**Languages :** Spanish, German, English, Italian, Catalan.

**Research Projects:**

- European Project „GALATEA“  
ESPRIT Project 5293 (1992-1994)
- European Project „Computational Tools and Industrial Applications of  
Complexity“  
ESPRIT Project 21042 (1997-1999)
- European Project „ALAVLSI“  
IST-2001-38099 (2002-2005)
- Siemens AG-Project „Computational Neuroscience“  
(2003-2006)
- Deutsch Forschungsgemeinschaft (DFG)  
Germany Ministry  
„Attention and Dynamics“  
(2003-2005)
- Royal Society Project  
British Council  
Ref. Nr. 15619  
(2003-2005)
- Plan Nacional de Investigación Científica  
(Ministerio de Educación y Ciencia, Spain)  
Project: „Mechanisms of Multisensory and Temporal Integration in  
Cognition and Intelligent Systems“ (TIN2004-04363-C03-01)

- European Project „EmCap“  
„Emergent Cognition Through Active Perception“  
FP6-2002-IST, 013123-2  
(2005-2008)
- European Project  
„Neural Decision in Motion“  
FP6-IST-4  
(2006-2009)
- Volkswagen-Foundation  
„Audiovisual Processing of Speech and Non-Speech Oral Gestures“  
(2006-2009)
- BMBF (German Ministry for Science)  
„Brain Plasticity and Perceptual Learning: Experimental Analysis and  
Computational Modeling“ (Ref.: 01GW0761)  
(2008-2010)
- Plan Nacional de Investigación Científica  
(Ministerio de Educación y Ciencia, Spain)  
Project: „From Detection to Decision: Neurodynamical Model of  
Higher Order Cortical Processing “ (BFU2007-61710/BFI)
- Bilingualism and Cognitive Neuroscience  
Consolider Ingenio 2010  
(Elite-Project of the Ministerio de Educación y Ciencia, Spain)  
(2008-2012)
- European Project (HEALTH FP7) „BrainSync“  
„Large Scale Interaction in Brain Networks and their Breakdown in  
DiseasesBrain“  
(2008-2010)

### **Supervised Master Thesis :**

- A. Martinez, Master in Physics  
at the University of Rosario.
- D. Ahlisch, Master in Computer Science  
at the Technical University of Munich
- C. Schittenkopf, Master in Computer Science  
at the Technical University of Munich
- J. Storck, Master in Computer Science  
at the Technical University of Munich
- N. Galm, Master in Physics  
at the Technical University of Munich
- C. Naeger, Master in Computer Science  
at the Technical University of Munich
- O. Polatos, Master in Psychology  
at the Ludwig-Maximilian University of Munich
- M. Perez, Master in Computer Science  
at the Universitat Pompeu Fabra

### **Supervised Ph.D Thesis :**

- L. Parra, Ph.D in Physics  
at the Ludwig-Maximilian University of Munich
- C. Schittenkopf, Ph D in Computer Science  
at the Technical University of Munich
- S. Kriebel, Ph D in Computer Science  
at the Technical University of Munich
- M. Szabo, Ph.D in Computer Science  
at the Technical University of Munich
- N. Galm, Ph.D in Computer Science  
at the Technical University of Munich
- A. Stemme, PhD in Psychology  
at the Ludwig-Maximilian University of Munich
- D. Marti, PhD in Computer Science  
at the Universitat Pompeu Fabra
- M. Loh, PhD in Computer Science  
at the Universitat Pompeu Fabra

### **Afiliations:**

Member of the Editorial Board of Journal of Physiology Paris  
Member of the Editorial Board of Cognitive Neurodynamics  
Action Editor of Neural Networks  
Referee of: Physical Review, Physical Review Letters, Neural Computation,  
Network, Neural Networks, IEEE Transactions, Vision  
Research, J. Cog. Neurosc., PLoS Comp. Biology, ...  
Member of the European Neural Network Society  
Member of the German Society of Neuroscience  
Member of the Society for Neuroscience (USA)  
Member of the Society for Cognitive Neuroscience (USA)

### **Conferences Organization:**

First ESF (European Science Foundation) Workshop on Computational Neuroscience: Understanding Brain Functions

Barcelona, Spain

June 2005

(see <http://final.upf.es/cnscience/>)

Symposium „Computational Model on Vision“

(Organizers: L. Wiskott and G. Deco)

at the 31st Göttingen Neurobiology Conference

Göttingen, Germany

March 2007

Brain Connectivity Workshop 2007.

Barcelona, Spain

May 2007

(see <http://www.ina.upf.es/recerca/ComputationalNeuroscience/bcw2007>)

„Decision-Making in the Brain“

(Organizers: E. Rolls and G. Deco)

at the Autumn School in Cognitive Neuroscience

Oxford, United Kingdom

September 2007

Symposium 11: „Computational Approaches to Cortical Functions: From Perception to Action“

(Organizers: A. Compte and G. Deco)

at the XII Congreso Sociedad Española de Neurociencia

Valencia, Spain

September 2007

## Invited Lectures:

- "Relativistische Kollisionen"  
Justus-Liebig-Universität Gießen, August 1987,  
Gießen, Germany.  
(Invited by Prof. Dr. W. Scheid)
  
- "Transinformation und Neuronale Netze"  
Ludwig-Maximilian-Universität, August 1993,  
Munich, Germany.  
(Invited by Dr. R. Hennicker)
  
- "Unsupervised Boltzmann Machines"  
Siemens Corporate Research, July 1993,  
Princeton, USA.  
(Invited by Dr. S. Hanson)
  
- "Overfitting in Neural Networks"  
Tokai University, November 1993,  
Tokai, Japan.  
(Invited by Prof. Dr. Ryotaro Kamimura)
  
- "Information Theory and Neural Networks"  
Hitachi Laboratories, November 1993,  
Hitachi, Japan.  
(Invited by Hitachi Corporate Research)
  
- "Theory of Unsupervised Learning of Nonlinear Processes",  
J. W. v. Goethe Universität Frankfurt, December 1994,  
Frankfurt, Germany.  
(Invited by Prof. Dr. Martienssen)
  
- "Infomax and Redundancy Minimization Theory",  
Technische Universität München, January 1995,  
Munich, Germany.  
(Invited by Prof. Dr. Van Hemmen)
  
- "An Information Theoretic Approach to Unsupervised Learning",  
Technische Universität München, November 1995,  
Munich, Germany.  
(Invited by Prof. Dr. W. Brauer)
  
- "Time Series Analysis and Information Dynamics",  
Humboldt Universität Berlin, January 1996,  
Berlin, Germany.  
(Invited by Prof. Dr. W. Ebeling)
  
- "Learning Theory: Parametrical and Nonparametrical Formulation",  
Technische Universität München, July 1996,  
Munich, Germany.  
(Invited by Prof. Dr. W. Brauer)

- "An Information Theoretic Approach to Learning",  
Ruhr-Universität Bochum, October 1996,  
Bochum, Germany.  
(Invited by Prof. Dr. W. von Seelen)
  
- "Learning Theory: Parametrical and Nonparametrical Formulation"  
Technische Universität Berlin, November 1996,  
Berlin, Germany.  
(Invited by Dr. S. Rueger)
  
- "Informationdynamics and Biomedical Signal Processing",  
Universität Würzburg, December 1996,  
Würzburg, Germany.  
(Invited by Prof. Dr. W. Kinzel)
  
- "Data Selection in Temporal time Series"  
Max-Planck-Institut für Psychologische Forschung, January 1997,  
Munich, Germany.  
(Invited by Dr. L. Martignon)
  
- "Informationdynamics"  
Max-Planck-Institut für extraterrestrische Physik, January 1998,  
Munich, Germany.  
(Invited by Dr. H. Atmanspacher)
  
- "An Information Theoretic Approach to Learning"  
Universität Freiburg, January 1998,  
Freiburg, Germany.  
(Invited by Prof. Dr. B. Nebel)
  
- "A Neurodynamical Model for Selective Visual Attention"  
University of Birmingham, Dept. of Psychology, September 1999,  
Birmingham, England.  
(Invited by Prof. Dr. G. Humphreys)
  
- "A Neurodynamical Model for Selective Visual Attention"  
Ludwig-Maximilians-University,  
Institut für Medizinische Psychologie, December 1999,  
Munich, Germany.  
(Invited by Prof. Dr. I. Rentschler)
  
- "A Neurodynamical Model for the Resolution Hypothesis"  
Carnegie Mellon University,  
Center for the Neural Basis of Cognition, February 2000,  
Pittsburgh, USA.  
(Invited by Prof. Dr. T. Lee)
  
- "The Computational Neuroscience of Visual Attention"  
Ruhr-Universität Bochum, May 2000,  
Bochum, Germany.  
(Invited by Prof. Dr. C. von der Malsburg)

- "Biased Competition Mechanisms for Visual Attention in a Multimodular Neurodynamical System"  
Universität Ulm, June 2000,  
Ulm, Germany.  
(Invited by Prof. Dr. G. Palm)
  
- "The Computational Neuroscience of Visual Attention"  
GMD FIRST, June 2000,  
Berlin, Germany.  
(Invited by Prof. Dr. K.R. Müller)
  
- "The Computational Neuroscience of Visual Attention"  
Universitätsklinikum "Benjamin Franklin"  
Freie Universität Berlin, June 2000,  
Berlin, Germany.  
(Invited by Dr. G. Curio)
  
- "Modelling of Active Perception: Neuropsychological Relevance"  
University of Birmingham, Dept. of Psychology, August 2000,  
Birmingham, England.  
(Invited by Prof. Dr. G. Humphreys)
  
- "The Computational Neuroscience of Visual Attention"  
University of Oxford, Dept. of Psychology, September 2000,  
Oxford, England.  
(Invited by Prof. E. Rolls)
  
- "Dynamische Systeme: Ein informationstheoretischer Zugang"  
Universität Innsbruck, Institut für Mathematik, October 2000,  
Innsbruck, Austria.  
(Invited by Prof. S. Hellebrand)
  
- "Neurokognitiven Mechanismen zur aktiven Bildverarbeitung"  
Technische Universität München, February 2001,  
Munich, Germany.  
(Invited by Prof. Dr. J. Eberspächer)
  
- "The Computational Neuroscience of Visual Attention"  
Max-Planck-Institut fuer Hirnforschung, March 2001,  
Frankfurt, Germany.  
(Invited by Prof. Dr. W. Singer)
  
- "Neurokognitiven Mechanismen zur aktiven Bildverarbeitung"  
Deutsches Zentrum für Luft- und Raumfahrt, March 2001,  
Berlin, Germany.  
(Invited by Dr. van der Meer)
  
- "An Interactive Neurodynamical Model of Biased Competition  
for Attentive Object Recognition and Visual Search"  
University of Alberta, April 2001,  
Edmonton, Canada.  
(Invited by Prof. Dr. T. Caelli)

- "The Computational Neuroscience of Visual Attention"  
Department of Neurological and Vision Sciences  
Section of Physiology, University of Verona, May 2001,  
Verona, Italy.  
(Invited by Prof. Dr. L. Chelazzi)
  
- "The Computational Neuroscience of Visual Attention"  
Max-Planck-Institut fuer biologische Kybernetik, May 2001,  
Tübingen, Germany.  
(Invited by Dr. F. Volker)
  
- "The Computational Neuroscience of Visual Attention"  
Universität Paderborn, July 2001,  
Paderborn, Germany.  
(Invited by Prof. Dr. H. Grotstollen)
  
- "Neurodynamical Modeling in Vision"  
Sommer School on "Connectionist Modeling".  
University of Oxford, Dept. of Psychology, July 2001,  
Oxford, England.  
(Invited by Prof. Dr. E. Rolls)
  
- "The Neurodynamics of Spatial and Object Attention"  
2001 Autumn School in Cognitive Neuroscience  
McDonnell-Pew and MRC IRC Centres for Cognitive Neuroscience  
University of Oxford, September 2001,  
Oxford, England.
  
- "Computational Neuroscience of Vision"  
Max-Planck-Institut für extraterrestrische Physik, October 2001,  
Munich, Germany.  
(Invited by Prof. Morfill)
  
- "Neurokognitiven Mechanismen zur aktiven Bildverarbeitung"  
Universität Innsbruck, Institut für Informatik, October 2001,  
Innsbruck, Austria.  
(Invited by Prof. S. Hellebrand)
  
- "Neurokognitiven Mechanismen zur aktiven Bildverarbeitung"  
Universität Osnabrück, Fachbereich Mathematik/Informatik, October 2001,  
Osnabrück, Germany.  
(Invited by Prof. S. Sperschneider)
  
- "The Computational Neuroscience of Visual Attention"  
Universität Lübeck, Institut für Neuroinformatik, Februar 2002,  
Lübeck, Germany.  
(Invited by Prof. Th. Martinetz)

- "The Computational Neuroscience of Visual Attention"  
 Universität München, Medizinische Fakultät (Alzheimer Institut), Februar 2002,  
 Munich, Germany.  
 ( Invited by Prof. H. Hampel)
  
- "Neurodynamische Mechanismen der Informationsverarbeitung im visuellen Cortex"  
 Universität Düsseldorf, Physikalische Fakultät, Juni 2002,  
 Düsseldorf, Germany.  
 ( Invited by Prof. R. Egger)
  
- "Neurocortical Mechanisms Underlying Visual Attention"  
 SISSA / ISAS, Scuola Internazionale Superiore di Studi Avanzati, Juli 2002,  
 International School for Advanced Studies.  
 Trieste, Italy.  
 ( Invited by Prof. M. Diamond)
  
- "Computational Neuroscience of Visual Cognition"  
 Laboratory of Computational Neuroscience, Oktober 2002,  
 Ecole Polytechnique Fédérale de Lausanne.  
 Lausanne, Switzerland.  
 ( Invited by Prof. M. Gerstner)
  
- "Computational Neuroscience of Visual Cognition: Attention and Working Memory"  
 Department of Computer Science, Oktober 2002,  
 Universitat Pompeu Fabra.  
 Barcelona, Spain.  
 ( Invited by Prof. V. Lopez)
  
- "Computational Neuroscience of Visual Cognition: Attention and Working Memory"  
 Department of Psychology, Oktober 2002,  
 University of Barcelona.  
 Barcelona, Spain.  
 ( Invited by Prof. N. Sebastian Galles)
  
- "Computational Neuroscience of Visual Cognition"  
 BENEFRI Course 2003,  
 Neocortical Functions: From Neurons to Behavior, March 2003,  
 University of Bern.  
 Bern, Switzerland.  
 ( Invited by Prof. W. Senn)
  
- "'What' and 'Where' in Visual Working Memory: A Computational Neurodynamical  
 Perspective for Integrating fMRI and Single-Neuron Data"  
 Institute of Neuroscience, April 2003,  
 University of Plymouth.  
 Plymouth, United Kingdom.  
 ( Invited by Prof. Jochen Braun)

- "The Neurodynamics of Attention, Working Memory and Reward Reversal"

Institute of Neuroinformatics, May 2003,

ETH-University of Zurich.

Zurich, Switzerland.

(Invited by Prof. P. König)

- "Attention, Memory and Reward Learning: A Computational Neuroscience Perspective"

2003 Autumn School in Cognitive Neuroscience

McDonnell-Pew and MRC IRC Centres for Cognitive Neuroscience

University of Oxford, October 2003,

Oxford, England.

(Invited by Prof. E. Rolls)

- "The Computational Neuroscience of Visual Cognition"

EPSRC Research Cluster in Brain-Inspired Computation

Finnstown Center, October 2003,

Dublin, Ireland.

(Invited by Prof. M. Deham)

- "Neural and Cortical Modeling of Visual Attention, Memory and Reward Learning"

Gemeinsames Forschungs-Kolloquium „Allgemeine und Experimentelle Psychologie“

Max-Planck- Institut für Psychologische Forschung und

Ludwig-Maximilians-Universität München, November 2003,

Munich, Germany.

(Invited by Prof. H. Müller)

- "Neural and Cortical Modeling of Visual Attention, Memory and Reward Learning"

Instituto de Neurociencia

Universidad Miguel Hernandez, November 2003,

Alicante, Spain.

(Invited by Prof. M. Sanchez-Vives)

- "Neural and Cortical Modeling of Visual Attention, Memory and Reward Learning"

Escuela Superior Politecnica

Universidad Autonoma de Madrid, November 2003,

Madrid, Spain.

(Invited by Prof. E. Serrano)

- "Neurodynamical Competition and Cooperation in Cortical Networks: From Spiking Neurons to Cognition"

Institut for Theoretical Biology

Humboldt-Universität zu Berlin, June 2004,

Berlin, Germany.

(Invited by Prof. A. Herz)

- "Neurodynamical Competition and Cooperation in Cortical Networks"

Department of Computer Science

University of Helsinki, December 2004

Helsinki, Finland.

(Invited by Prof. A. Hyvärinen)

- "Computational Neuroscience of Visual Cognition I - II"  
Departamento de Física y Departamento de Psicología  
Universidad de las Islas Baleares, February 2005,  
Palma de Mallorca, Spain.  
(Invited by Prof. C. Mirasso)
  
- "Neural Mechanisms Underlying a Decision-Making Task"  
Department of Psychology  
University of Oxford, February 2005,  
Oxford, United Kingdom.  
(Invited by Prof. E. Rolls)
  
- "Theories of the Cerebral Cortex"  
Department of Neuroscience, Division of Brain Research  
Karolinska Institute, May 2005  
Stockholm, Sweden.  
(Invited by Prof. P. Roland)
  
- "The Computational Neuroscience of Visual Cognition"  
Department of Psychology  
Universidad de Almería, May 2005  
Almería, Spain.  
(Invited by Prof. J. Ortells)
  
- "Competition and Cooperation in Cortical Networks"  
Fundación Duques de Soria, Seminario de Neurociencias, July 2006  
„Brain Mechanisms of Attention: Biological and Computational Approaches“  
Soria, Spain.  
(Invited by Prof. C. Belmonte)
  
- "The Neurophysiology of Decision-Making"  
Centre de Recherche Cerveau et Cognition  
Université Paul Sabatier, and CNRS, May 2006  
Toulouse, France.  
(Invited by Prof. S. Thorpe)
  
- "Neurodynamical Mechanisms Underlying Probabilistic Aspects of Decision-Making:  
Weber's Law"  
Kognitionsbiologie  
Otto-von-Guericke-Universität Magdeburg, November 2006  
Magdeburg, Germany.  
(Invited by Prof. J. Braun)
  
- "The Neurophysiology of Decision-Making"  
Ruhr-Universität Bochum, January 2007,  
Bochum, Germany.  
(Invited by Prof. G. Schoener)
  
- "Neuronal and Cortical Mechanisms Underlying Decision-Making"  
Max-Planck Institute for Biological Cybernetics, October 2007,  
Tübingen, Germany.  
(Invited by Prof. N. Logothetis)

- "The Neuronal Basis of Decision-Making and Perception"  
Universitätsklinikums Hamburg-Eppendorf, October 2008,  
Hamburg, Germany.  
(Invited by Prof. A. Engel)

## Talks in Conferences:

- "Ultrarelativistic Electron Capture in Ion-Atom Collisions"  
The XIV International Conference on the Physics of Electronic and Atomic Collisions,  
July 1985, Stanford University, USA.
- "Relativistic Effects: CDW Approximations"  
IX International Seminar on Ion-Atom Collisions,  
July 1985, Flagstaff, Northern Arizona University, USA.
- "Mechanical Charge Exchange Processes in Relativistic Atomic Collisions"  
International Seminar on Ion Atom Collisions X,  
July 1987, Bad Soden, Germany.
- "Pair Creation as Intermediate Mechanism of Electron Capture"  
International Seminar on ion Atom Collisions X,  
July 1987, Bad Soden, Germany.
- "Colisiones a Altas Energias con Producción de Pares Electrón-Positrón"  
Encuentro Latinoamericano de Física Atómica,  
August 1988, Brasil.
- "Doppelladungsaustausch im Alpha-Helium Stößen im Hoch-Energiebereich"  
X Energiereiche Atomare Stöße Tagung  
January 1989, Mittelberg, Austria.
- "First Order Perturbation Calculations of Ionization in Relativistic Collisions"  
European Conference of Atomic and Molecular Physics  
April 1989, Bordeaux, France.
- "Pair Production in Relativistic Atomic Collisions"  
XVI International Conference on Physics of Electronic and Atomic Collisions,  
July 1989, New York, US A.
- "Elimination of Overtraining by a Mutual Information Network"  
International Conference on Artificial Neural Network  
September 1993, Amsterdam, Netherland.
- "Handwritten Digit Recognition with PCA and RBF"  
International Joint Conference on Neural Networks  
October 1993, Nagoya, Japan.
- "Self-Organization in Stochastic Neural Networks"  
International Joint Conference on Neural Networks  
October 1993, Nagoya, Japan.
- "A Stochastic Network with Rotor Neurons"  
International Joint Conference on Neural Networks  
October 1993, Nagoya, Japan.

- "Lernen von Dynamischen Invarianten von Chaotischen Reihen mit Neuronalen Netzen"  
3. Jahrestagung: Chaos und Strukturbildung,  
November 1993, München, Germany.
- "Principal Component Analysis: A Factorial Learning Approach"  
International Conference on Artificial Neural Networks  
May 1994, Sorrento, Italy.
- "Inherent Information Flow in Chaos",  
Dynamics and Control of Physical Systems,  
May 1995, Cortona, Italy.
- "Statistical Features Extraction"  
Dynamics and Control of Physical Systems,  
May 1995, Cortona, Italy.
- "Information Flow in Chaotic Systems"  
International Conference on Complexity and Self-Organization,  
September 1995, Berlin, Germany.
- "Infomax and Redundancy Minimization in Linear and Non-Linear Architectures"  
Interdisciplinary Workshop on Neural Networks,  
October 1995, Würzburg, Germany.
- "An Information-Theoretic Approach to Unsupervised Learning"  
Workshop on Information Theory and Coding,  
December 1995, Vail, USA.
- "Nonparametric Data Selection for Improvement of Parametric Neural Learning:  
A Cumulant-Surrogates Method"  
International Conference on Artificial Neural Networks,  
July 1996, Bochum, Germany.
- "Training Data Selection by Detecting Predictability in Non-Stationary Time Series  
by a Surrogate-Cumulant Based Approach"  
International Workshop on Neural Networks for Identification, Control, Robotics,  
and Signal/Image Processing,  
August 1996, Venedig, Italy.
- "Neuronale und informationstheoretische Methoden zur Analyse  
nichtlinearer dynamischer Systeme"  
2. Cottbuser Workshop: Aspekte Neuronalen Lernens,  
October 1996, Cottbus, Germany.
- "Testing Nonlinear Markovian Hypotheses in Dynamical Systems"  
Fourth SIAM Conference on Applications of Dynamical Systems  
May 1997, Snowbird, Utah, USA.
- "An Information-Theoretic Analysis of Temporal Coding Strategies by Spiking  
Central Neurons"  
International Conference on Artificial Neural Networks,  
October 1997, Lausanne, Swiss.

- "Spatio-Temporal Coding in the Cortex"  
Workshop on Neurostatistics and Cell Assemblies,  
December 1997, Breckenridge, USA.
- "Nonlinear Dynamics of the Daily Heart Rhythm"  
Computational Tools and Industrial Applications of Complexity,  
Januar 1998, Thessaloniki, Greece.
- "A Neuronal Model of Binding and Selective Attention for Visual Search"  
5th Neural Computation and Psychology Workshop,  
Connectionist Models in Cognitive Neuroscience  
September 1998, Birmingham, England.
- "Spatio-Temporal Coding in the Cortex: Information Flow Based Learning in Spiking  
Neural Networks"  
Winterschool: Spiking Neurons and Synaptic Plasticity,  
December 1998, Berlin, Germany.
- "Nonlinear Markovian Dynamics of the Daily Heart Rhythm"  
Workshop: Computational Tools and Industrial Applications of Complexity,  
Februar 1999, Moskau, Russia.
- "A Neurodynamical Model of Visual Attention: Feedback Enhancement of Spatial  
Resolution"  
Workshop on "Visual Selection Mechanisms",  
Dezember 1999, Breckenridge, USA.
- "Biased Competition Mechanisms for Visual Attention in a Multimodular Neurodynamical  
System"  
Workshop on "Current Computational Architectures Integrating Neural Networks and  
Neuroscience",  
August 2000, Durham, England.
- "A Neurodynamical Model of Visual Attention: Feedback Enhancement of Spatial  
Resolution in a Hierarchical System"  
3. Workshop Dynamische Perzeption  
November 2000, Ulm, Germany.
- "The Neurodynamics of Spatial and Object Attention"  
International Workshop on "The Mathematical, Computational and Biological Study of  
Vision"  
November 2001, Oberwolfach, Germany.
- "Neurodynamical Mechanisms Underlying Visual Attention"  
II. Sino-German Advanced Workshop in Cognitive neuroscience and Psychology,  
April 2002, Munich, Germany.

- "A Neurodynamical Theory of Visual Attention: Comparisons with fMRI- and Single-Neuron Data"  
International Conference on Artificial Neural Networks,  
August 2002, Madrid, Spain.
- "Neurodynamical Modeling of Visual Cognition: Attention and Working Memory"  
Workshop on System Level Modeling,  
November 2002, Columbus (Ohio), USA.
- "Neurodynamische Mechanismen der visuellen Kognition: Aufmerksamkeit und Arbeitsgedächtnis",  
TWK 2003, 6<sup>th</sup> Perception Conference at Tübingen,  
February 2003, Tübingen, Germany.
- "The Neurodynamics of Visual Search",  
Munich Visual Search Symposium,  
June 2003, Holzhausen am Ammersee, Germany.
- "The Role of Attention in Visual Perception: A Computational Neuroscience Model"  
The 16th International Conference on Vision Interface,  
June 2003, Halifax, Canada.
- "Integrating fMRI and Single-Cell Data of Visual Working Memory"  
CNS 2003, The Annual Computational Neuroscience Meeting,  
July 2003, Alicante, Spain.
- "The Role of Attention in Vision and Action"  
Reinforcement Learning: Dopamine, Attention and Computational Models  
April 2004, Amsterdam, The Netherlands.
- "Neurodynamical Competition and Cooperation in Cortical Networks"  
New Perspectives on Visual Cortex  
April 2004, Tobermory, Isle of Mull, United Kingdom.
- "Learning to Attend Relevant Features in a Categorization Task"  
II Workshop on Concepts and Category  
June 2004, Barcelona, Spain.
- "The Computational Neuroscience of Visual Cognition: Attention, Memory and Reward",  
Plenary Talk, in 2<sup>nd</sup> International Workshop on Attention and Performance in Computational  
Vision, by the Eighth European Conference on Computer Vision  
May 2004, Prague, Czech Republic.
- "Neural and Synaptic Dynamics Underlying Cross-modal and Cross-temporal Firing Rate  
Activity in Association Cells of the Prefrontal Cortex"  
Fifth Meeting of the International Multisensory Research Forum  
June 2004, Sitges, Spain.
- "Spiking and Synaptic Mechanisms Underlying Biased Competition and Cooperation in  
Attention"  
Fourth Forum of European Neuroscience  
July 2004, Lisbon, Portugal.

- "Neurodynamical Competition and Cooperation in Cortical Networks: From Spiking Neurons to Behaviour"  
International Workshop on Object Recognition, Attention and Action  
August 2004, Kyoto, Japan.
- "Computational Vision"  
European Summer School: "Visual Neuroscience: From Spikes to Awareness"  
September 2004, Schloss Rauschholzhausen, Germany.
- "The Spiking and Synaptic Basis of fMRI-Signal in the Prefrontal Cortex Associated with Cognitive Flexibility"  
Brain Functioning: Advances in Magnetic Resonance Imaging  
November 2004, Barcelona, Spain.
- "Neurodynamical Mechanisms Underlying Brain Functions"  
Knowledge Exploration in Life Science Informatics,  
November 2004, Milano, Italy.
- "Dinámica Neuronal, Sináptica y Cortical en Percepción y Cognición Visual"  
Imagen y Vision  
April 2005, Santiago de Compostela, Spain.
- "A Computational Neuroscience Approach to Visual Cognition"  
First Iberian Congress on Perception,  
July 2005, Barcelona, Spain.
- "A Computational Neuroscience Approach to Visual Cognition"  
International Workshop on Bioinspired Information Processing: Cognitive Modeling and Gaze-Based Communication,  
September 2005, Lübeck, Germany.
- "The Role of Fluctuations in Decision-Making"  
Second Cajal Winter Conference, Cerebral Cortex: From Development to Cognition  
March 2006, Benasque, Spain.
- "A Neurophysiological Model of Decision-Making and Weber's Law"  
Experimental Psychology Society, Birmingham Meeting,  
April 2006, Birmingham, United Kingdom.
- "Competition and Cooperation Mechanisms in Neural and Cortical Dynamics: Attention, Memory and Decision-Making"  
Fifth Brain Connectivity Workshop  
May 2006, Sendai, Japan.
- "Fluctuation-driven Neurodynamics: A model of Decision-Making"  
Workshop on "Information Theory, Neurobiology and Cognition"  
Max-Planck Institute for Mathematics in the Sciences  
July 2006, Leipzig, Germany.
- "The Neurodynamics of Visual Search"  
50 Años de la Inteligencia Artificial, XVI Escuela de Verano de Informatica, EVI-2006  
July 2006, Albacete, Spain.

- "The Role of Statistical Fluctuations in Probabilistic Decision-Making"  
NEUROMATH 06, Conference on Mathematical Neuroscience  
August 2006, Andorra.
- "Theoretical Neuroscience"  
First Summer School on "Theoretical Neuroscience and Complex Systems"  
FIAS: Frankfurt Institute for Advanced Studies  
August 2006, Frankfurt, Germany.
- "Computational and Theoretical Neuroscience"  
European Summer School: "Visual Neuroscience: From Spikes to Awareness"  
September 2006, Schloss Rauischholzhausen, Germany.
- "A Neurophysiological Model of Decision-Making: The Role of Fluctuations in Neurodynamics"  
9th Granada Seminar on Computational and Statistical Physics  
September 2006, Granada, Spain.
- "Neurodynamical Competition and Cooperation in Cortical Networks: From Spiking Neurons to Behavior"  
Deutsche Gesellschaft für Psychiatrie, Psychotherapie und Nervenheilkunde  
DGPPN Kongress  
November 2006, Berlin, Germany.
- "A Computational Model of Schizophrenic Symptoms in Attractor Networks"  
Deutsche Gesellschaft für Psychiatrie, Psychotherapie und Nervenheilkunde  
DGPPN Kongress  
November 2006, Berlin, Germany.
- "Competition and Cooperation Cortical Mechanisms in Cognition"  
First GOSPEL Workshop on Bioinspired Signal Processing  
January 2007, Barcelona, Spain.
- "Neurodynamical Mechanisms Underlying Visual Cognition"  
Honda International Workshop: "Creating Brain-Like Intelligence"  
February 2007, Frankfurt, Germany.
- "Weber's Law in Decision-Making: Integrating Behavioral Data in Humans with a Neurophysiological Model"  
International BBSRC-Workshop: Closing the Gap Between Neurophysiology and Behavior: A Computational Modelling Approach, University of Birmingham.  
July 2007, Birmingham, United Kingdom.
- "Neurodynamical Mechanisms Underlying Decision-Making  
Nonlinear 2007.  
June 2007, Ciudad Real, Spain.
- "The Cortical Dynamics Underlying Decision-Making: From Neurons to Behaviour"  
Plenary Talk at the International Conference on Artificial Neural Networks, ICANN 2007. September 2007, Porto, Portugal.
- "Neural and Computational Mechanisms Underlying Decision-Making"

Symposium 11, XII Congreso Sociedad Española de Neurociencia, SENC 2007.  
September 2007, Valencia, Spain.

- "Neurodynamical Mechanisms Underlying Decision-Making: The Role of Statistical Fluctuations"

XX Congreso de Ecuaciones Diferenciales y Aplicaciones, CEDYA 2007.  
September 2007, Sevilla, Spain.

- "Neural and Computational Mechanisms Underlying Decision-Making "

Autum School in Cognitive Neuroscience, University of Oxford.  
September 2007, Oxford, United Kingdom.

- "Zur Bedeutung der "Computational Neuroscience" für die Psychiatrie-Konzepte, Methoden, Modelle"

Symposium XIV : Computational Neuropsychiatry (Orgs. F. Tretter/G. Winterer), AGNP: Arbeitsgemeinschaft für Neuropsychopharmakologie und Pharmacopsychiatrie.  
October 2007, Munich, Germany.

- "Stochastic Neurodynamics as a Basic Mechanism for Perception"

Plenary Talk at Coherent Behavior in Neural Networks.  
October 2007 Mallorca, Spain.

- "Neurocomputational Models of Neurocommunication"

The Marie Curie School in Neuroscience:  
Large-Scale Interactions in Brain Networks and  
Their Breakdown in Brain Diseases.  
March 2008, Santo Stefano di Sessanio, Italy.

- "The Neurodynamics of Decision Making"

Nolineal 2008.  
June 2008, Ciudad Real, Spain.

- "The Neural Basis of Attention: Rate vs. Synchronization Modulation"

Symposium "Neural Correlates of Spatial and Feature-based Attention.  
International Graduate School of Neuroscience.  
Ruhr-Universität Bochum.  
June 2008, Bochum, Germany.

- "Models in Cognitive Neuroscience"

Educational Courses, Human Brain Mapping.  
June 2008, Melbourne, Australia.

- "Cortical Dynamics at Rest: The Role of Fluctuations and Delays"

Brain Connectivity Workshop.  
June 2008, Sidney, Australia.

- "Computational Neuroscience"

European Summer School: "Visual Neuroscience: From Spikes to Awareness"  
September 2008, Schloss Rauischholzhausen, Germany.

- "Computational Neuropsychiatry: Neuronal Fluctuations, Dynamics and Schizophrenia"

ESF Workshop on Computational Disease Modeling.  
September 2008, Barcelona, Spain.

- "Computational Modeling"  
PENS WICN Summer School Programme.  
September 2008, Bangor, United Kingdom.
- "The Intrinsic Properties of the Brain: The Role of Fluctuations During Rest"  
Conference française de Neurosciences Computationnelles.  
October 2008, Marseille, France.
- "Stochastic Dynamics as a Principle of Perception"  
3<sup>rd</sup> Toyota CRDL Workshop: Mathematical Methods in Complex Systems.  
October 2008, Gemenos, France.
- "Integrating Behavioral Data in Humans with a Neurophysiological Model"  
Deutsche Gesellschaft für Psychiatrie, Psychotherapie und  
Nervenheilkunde (DGPPN) Kongress.  
November 2008, Berlin, Germany.
- "The Intrinsic Properties of the Brain: The Role of Fluctuations During Rest"  
Resting State Workshop.  
December 2008, Magdeburg, Germany.
- "Stochastic Dynamics as a Principle of Perception and Decision Making"  
Plenary Lecture at Neuro-Mechanics, Dynamics and Decision Making.  
The James H. Belfer Memorial Symposium Series, Technion.  
February 2009, Haifa, Israel.
- "The Neurodynamics of Attention, Memory, and Decision Making "  
Advanced Course at the Workshop on Deterministic and Stochastic Modeling in  
Computational Neuroscience and Other Biological Topics, Centre de Recerca Matemàtica.  
May 2009, Barcelona, Spain.
- "Stochastic Dynamics as a Principle of Brain Function"  
Cognition Workshop at the 31<sup>st</sup> Annual Meeting of the Cognitive Science Society.  
July 2009, Amsterdam, The Netherlands.
- "The Computational Neuroscience of Attention, Memory, and Decision Making"  
Plenary Lecture at the Summer Program 2009, RIKEN Brain Science Institute.  
July 2009, Tokyo, Japan.
- "Large- Scale Architecture of Visual Perception"  
Computational Vision Course (European Training Workshop CODDE)  
September 2009, Schloss Rauischholzhausen, Germany.
- "The Neurodynamical Basis of Attention "  
Autum School in Cognitive Neuroscience, University of Oxford.  
September 2009, Oxford, United Kingdom.
- "The Intrinsic Properties of the Brain: Resting State"  
Symposium II, XIII Congreso Sociedad Española de Neurociencia.  
September 2009, Tarragona, Spain.

## Patents:

- 1) 1995P02051 DE "Lernverfahren und Anordnung zur Nachbildung eines dynamischen Prozesses", G. Deco and J. Storck  
conceded in: Germany, USA
- 2) 1996P01205 DE "Verfahren zur Klassifikation einer Zeitreihe, die eine vorgebbare Anzahl von Abtastwerten aufweist, insbesondere eines elektrischen Signals, durch einen Rechner", G. Deco und B. Schürmann  
conceded in: Germany, France and England
- 3) 1996P01207 DE "Verfahren zur Klassifikation einer Zeitreihe, die eine vorgebbare Anzahl von Abtastwerten aufweist, insbesondere eines elektrischen Signals, durch einen Rechner", G. Deco and B. Schürmann  
conceded in: Germany, USA
- 4) 1996P01246 DE "Verfahren zur Klassifikation einer Zeitreihe, die eine vorgebbare Anzahl von Abtastwerten aufweist, beispielsweise eines elektrischen Signals, durch einen Rechner und Verwendung des Verfahrens ", G. Deco and B. Schürmann  
conceded in: Germany, USA
- 5) 1996P01608 DE "Verfahren zur Klassifikation einer Zeitreihe, die eine vorgebbare Anzahl von Abtastwerten aufweist, beispielsweise eines elektrischen Signals, durch einen Rechner", G. Deco and C. Schittenkopf  
conceded in: Germany, USA
- 6) 1996P01855 DE "Rechnergestütztes Verfahren zur Auswahl von Trainingsdaten für ein neuronales Netz", G. Deco, D. Obradovic and B. Schürmann  
conceded in: Germany, France, England
- 7) 1996P02453 DE "Verfahren zur Klassifikation der statistischen Abhängigkeit einer ersten Zeitreihe, die eine vorgebbare Anzahl von Abtastwerten, insbesondere eines elektrischen Signals, aufweist, durch einen Rechner", G. Deco and C. Schittenkopf  
conceded in: Germany, Netherlands, England  
pending in: Japan, USA.
- 8) 1997P01352 DE "Verfahren zur rechnergestützten Extraktion statistisch unabhängiger digitaler Signale aus digitalen Eingangssignalen", G. Deco and D. Obradovic  
conceded in: Germany, Netherlands, England, Finnland, Japan, USA

- 9) 1997P08002 DE "Verfahren zur Detektion von Synchronizität zwischen mehreren digitalen Messreihen mit Hilfe eines Rechners", G. Deco and L. Martignon  
conceded in: Germany, Netherlands, England, Austria, Israel, Japan, USA
- 10) 1997P08003 DE "Zur Detektion von Synchronizität zwischen mehreren digitalen Messreihen mit Hilfe eines Rechners", G. Deco and L. Martignon  
conceded in: Germany, Netherlands, England, Austria, Israel, Japan, USA.
- 11) 1997P08119 DE "Verfahren und Vorrichtung zur Klassifikation einer ersten Zeitreihe und einer zweiten Zeitreihe", G. Deco and C. Schittenkopf and R. Silipo  
conceded in: Germany
- 12) 1997P08121 DE "Anordnung zur Vorhersage einer Abnormalität eines Systems und zur Durchführung einer der Abnormalität entgegenwirkenden Aktion", G. Deco and L. Dubé  
conceded in: Germany, France, England, Italy, USA.
- 13) 1998P02394 DE "Verfahren zum Trainieren eines neuronalen Netzes, Verfahren zur Klassifikation einer Folge von Eingangsgrößen unter Verwendung eines neuronalen Netzes, neuronales Netz und Anordnung zum Trainieren eines neuronalen Netzes", G. Deco and B. Schürmann  
conceded in: Germany, France, England, Austria, Belgium, USA
- 14) 1999P01906 DE "Mustersuche", G. Deco and B. Schürmann  
conceded in: Germany, France, England, Austria, Italy, Netherlands, Japan, USA.
- 15) 1999P01907 DE "Mustersuche", G. Deco and B. Schürmann  
conceded in: Germany, France, England, Austria, Italy, Netherlands, Japan, USA.
- 16) 1999P01908 DE "Mustererkennung", G. Deco and B. Schürmann  
conceded in: Germany, France, England, Austria, Italy, Netherlands, Japan, USA.
- 17) 2001P09039 DE "Diskriminierung kontinuierlicher und multivariater Signale mit einem Netzwerk von pulsgekoppelten Oszillatoren", G. Deco and J. Storck  
Patent pending.
- 18) GR 99E2492 DE "Rekurrente Netze zur Klassifizierung dynamischer Signale", G. Deco and B. Schürmann  
Patent pending.

- 19) 2001P14962 DE "Gabor-rekurrente Netze zur effizienten Bildkodierung", G. Deco and B. Schürmann  
Patent pending.
- 20) 2000P19382 DE "Neurodynamisches System aus gepulsten Oszillatoren zur Aufmerksamkeitsgetriebenes Suche von Objekten", G. Deco and S. Corchs  
pending in: Germany.
- 21) GR 99E6770 DE "Multimodulares neurodynamisches System zur intelligenten, aufmerksamkeitsgesteuerten visuellen Suche", G. Deco and B. Schürmann  
pending in: Germany, France, England, Austria, Italy, Netherlands, Japan, USA.
- 22) 2001P09068 DE "Netzwerke aus gepulsten Neuronen mit dynamischen Synapsen zur Klassifizierung der Verkehrsdynamik in Rechnernetzen", G. Deco, J. Storck and B. Schürmann  
Patent pending.
- 23) 2000P01870 DE "Neurokognitives System zur visuellen Objekterkennung", G. Deco and B. Schürmann  
Patent pending.
- 24) 2000E14212 DE "Thought-Mouse", C. Hoffmann, J. Storck, G. Deco and B. Schürmann  
Patent pending.
- 25) 2000E16468 DE "Sprachsignalfilterung durch eine rekurrente aufmerksamkeitsbasierte Independent Component Analysis Prozedur", G. Deco and B. Schürmann  
pending in: Germany, France, England, Austria, Italy, Netherlands, Japan, USA.
- 26) 2001P14963 DE "IDENTIFY: Image-Based Diagnostics by Extraction, Neurocognitive Testing and Identification of Feature Yield", B. Schürmann, M. Stetter, G. Deco, and J. Storck.  
Patent pending.
- 27) 2000E18262 DE "SmartBot: Saccade-Based User Intention Detection", G. Deco, J. Storck, B. Schürmann, and M. Stetter.  
Patent pending.
- 28) 2001P14964 DE "ImageBot: Web Image Mining", G. Deco, J. Storck, B. Schürmann, and M. Stetter.  
Patent pending.
- 29) 2000E18297 DE "NeuroWarp: Vollautomatische inhaltsbasierte Bildüberlagerung (Warping) durch ein neurokognitives Modul", M. Stetter, G. Deco, J. Storck, and B. Schürmann.  
Patent pending.

- 30) 2001P16787 DE "CALIBRATOR: Calculation of Instantaneous BOLD-to-Spike Ratio by Accumulation of Total Oxygen", M. Stetter, S. Corchs, G. Deco, B. Schürmann, and J. Storck.  
Patent pending.
- 31) 2001P08864 DE "DIAMOND: Diagnostic Aid by Modelling of Neurocognitive Dynamics", S. Corchs, G. Deco, B. Schürmann, M. Stetter, and J. Storck.  
Patent pending.
- 32) 2001P08873 DE "Neurodynamische Architektur zur Aufmerksamkeitsbasierten Objekterkennung and visuelle Suche", G. Deco.  
Patent pending.
- 33) 2000E22858 DE "Speech Processing with Networks of Spiking Neurons and Dynamic Synapses", J. Stork, F. Jäkel, G. Deco, M. Stetter, and B. Schürmann.  
Patent pending.
- 34) 2001E04431 DE "Autonome Fahrzeugsteuerung basierend auf visuelle Suche", M. Stetter, G. Deco, and B. Schürmann.  
Patent pending.
- 35) 2002P12914 DE "fMRI-basierte Modellierung zur computergestützten Diagnostic: Extrahierung der funktionellen Konnektivität", G. Deco, and N. Galm.  
Patent pending.
- 36) 2002P12938 DE "fMRI-basierte Modellierung zur computergestützten Diagnostic: Verwendung nichtlinearer Konnektivitätsgleichungen", G. Deco, and N. Galm.  
Patent pending.
- 37) 2002P12929 DE "fMRI-basierte Modellierung zur computergestützten Diagnostic: Verwendungen von Statistiken höherer Ordnungen im Rahmen der "Structural Equatin Modeling"", G. Deco, and N. Galm.  
Patent pending.
- 38) 2002P12915 DE "fMRI-basierte Modellierung zur computergestützten Diagnostik", G. Deco, and N. Galm.  
Patent pending.
- 39) 2002E03585 DE "Hierarchical Neurodynamical Cortical Architecture for Invariant Object recognition", G. Deco.  
Patent pending.
- 40) 2002P12816 DE "Computer-Aided Drug Evaluation with fMRI for Cerebral Disorders", G. Deco, M. Stetter and N. Galm  
Patent pending .
- 41) 2002E18963 DE "Method for Quantitative Evaluation of fMRI Event-Related Signals by a Neurodynamical Model", G. Deco, S. Corchs  
Patent pending .

- 42) 2002E18964 DE "An Implementation of Working Memory for Intelligent Systems by a Network of Spiking Neurons", G. Deco  
Patent pending.
- 43) 2002E18964 DE "Neurodynamical Model of Event-related fMRI Measurements for Clinical Diagnosis", G. Deco  
Patent pending.
- 44) 2004P11578 DE "Dynamic Shaping of Feature Selectivity in IT by Visual Categorization", M. Stetter, R. Almeida, M. Szabo and G. Deco  
Patent pending.
- 45) 2004P03492 DE "Efficient Information Storage in Task-Relevant Working Memory by Propagation of Competition", R. Almeida , G. Deco and M. Stetter  
Patent pending.
- 46) 2003E13999 DE "Extended Biased Competition-Cooperation Neurocognitive Model for Attentional Filtering of Irrelevant Inputs", R. Almeida , G. Deco, M. Szabo and M. Stetter  
Patent pending.
- 47) 2004P11500 DE "Bioanalogue Mechanisms of Reward-Processing for Cognitive Flexibility", G. Deco and M. Stetter  
Patent pending.
- 48) 2004P14971 DE "Sequential Learning by Neurodynamical Mechanisms", G. Deco and M. Stetter  
Patent pending.
- 49) 2005E10500 DE "Bioanalogue Belohnungs-basiertes Lernverfahren zur Klassifizierung mit emergenter Merkmals-Selektivität im Inputraum", G. Deco, M. Szabo and M. Stetter  
Patent pending.
- 50) 2005E11915 DE "A Neurodynamical Architecture for Cross-Modal and Cross-Temporal Integration", G. Deco and M. Stetter  
Patent pending.
- 51) 2006 E22954 DE "Verfahren zur probabilistischen Entscheidungsfindung bei unsicherer Information", G. Deco and M. Stetter  
Patent pending.
- 52) 2006 E22959 DE "Verfahren zur intelligenten Situationserkennung in selbstorganisierenden Sensornetzen", G. Deco, M. Stetter, and L. Tambosi  
Patent pending.

## List of Publications of Gustavo Deco

### A) Publications of books:

- 1) "An Information-Theoretic Approach to Neural Computing"  
G. Deco and D. Obradovic  
Springer Verlag (New York), 1996.
- 2) "Information Dynamics: Foundations and Applications"  
G. Deco and B. Schürmann  
Springer Verlag (New York), 2000.
- 3) "The Computational Neuroscience of Vision"  
E. Rolls and G. Deco  
Oxford University Press, 2001.
- 4) "The Noisy Brain"  
E. Rolls and G. Deco  
Oxford University Press, 2010.

### B) In Reviews:

#### B-0: Special Edited Issues

- 1) Special issue on: „Theoretical and Computational Neuroscience: Understanding Brain Functions“, Journal of Physiology (Paris), **100**, Nos. 1-3, July/September 2006 (Ed. G. Deco).
- 2) Special issue on: „50 Years of Artificial Intelligence: a Neuronal Approach, Campus Multidisciplinary in Perception and Intelligence“, Neurocomputing, **71**, Nos. 4-6. (Eds.: A. Fernandez-Caballero, J. Mira, and G. Deco)

#### B-1: Publications in Theoretical Physics

- 1) "Electron Capture by Proton and Alpha Particle Impact on Helium Atoms", G. Deco, J. Maidagan and R. Rivarola, J. Phys. B: Atom. Mol. Phys., L707, **17**, 1984.
- 2) "Symmetric Eikonal Calculations in Charge Exchange Ion-Atom", R. Rivarola, G. Deco and J. Maidagan, Nuclear Instruments and Methods, **B10/11**, 222, 1987.
- 3) "Second Order Symmetric Eikonal Approximation for Electron Capture at High Energies", G. Deco and R. Rivarola, J. Phys. B: Atom. Mol. Phys., **18**, 2283, 1985.
- 4) "Symmetric Eikonal Approximation for Electron Excitation in Ion-Atom Collisions", G. Deco, P. Fainstein and R. Rivarola, J. Phys. B: Atom. Mol. Phys., **19**, 213, 1986.
- 5) "Relativistic Continuum Distorted Wave Model for Electron Capture", G. Deco and R. Rivarola, J. Phys. B: Atom. Mol. Phys., **19**, 1759, 1986.

- 6) "Symmetric Eikonal Theory for Electron Capture in Ion-Atom Collisions", G. Deco, R. Piacentini and R. Rivarola, *J. Phys. B: Atom. Mol. Phys.*, **19**, 3727, 1986.
- 7) "Application of a First-Born-Approximation for 2l-Electron Capture in Ion-Atom Collisions", G. Deco, J. Hanssen and R. Rivarola, *J. Phys. B: Atom. Mol. Phys.*, **19**, L635, 1986.
- 8) "A Theoretical Model for Charge Transfer at Relativistic Energies", G. Deco and R. Rivarola, *J. Phys. B: Atom. Mol. Phys.*, **20**, 317, 1987.
- 9) "Relativistic Distorted Wave Model for Electron Capture", G. Deco and R. Rivarola, *J. Phys. B: Atom. Mol. Phys.*, **B24/25**, 134, 1987.
- 10) "On Spin Flip-Charge Exchange in Relativistic Ion-Atom Collisions", G. Deco and R. Rivarola, *Nuclear Instruments and Methods*, **B28**, 154, 1987.
- 11) "Relativistic Electron Capture in Ion-Atom Collisions", G. Deco and R. Rivarola, *J. Phys. B: Atom. Mol. Phys.*, **20**, 3853, 1987.
- 12) "Relativistic Continuum Distorted Wave Model for Arbitrary Initial and Final Shells-Electron Capture in Ion-Atom Collisions", G. Deco and R. Rivarola, *J. Phys. B: Atom. Mol. Phys.*, **20**, 5117, 1987.
- 13) "Electron Capture Following Electron-Positron Pair Production in Relativistic Collisions", G. Deco and R. Rivarola, *J. Phys. B: Atom. Mol. Phys.*, **21**, 1229, 1988.
- 14) "Creation of Electron-Positron Pairs in the Target Field Followed by Electron Capture in the Target", G. Deco and R. Rivarola, *J. Phys. B: Atom. Mol. Phys.*, **21**, 1861, 1988.
- 15) "K-Shell Vacancy Production in Asymmetric Collisions", A. Martinez, G. Deco, P. Fainstein and R. Rivarola, *Nuclear Instruments and Method*, **B34**, 32, 1988.
- 16) "Introduction of Short Range Interactions in the CDW Theory of Electron Capture for Ion-Atom Collisions", H. Bachau, G. Deco, A. Salin, *J. Phys. B: Atom. Mol. Phys.*, **21**, 1403, 1988.
- 17) "Electron Capture in the Target Following Electron-Positron Pair Production in the Simultaneous Presence of the Fields of the Projectile and of the Target", G. Deco and R. Rivarola, *J. Phys. B: Atom. Mol. Phys.*, **21**, L299, 1988.
- 18) "Pair Production with Electron Capture in Relativistic Heavy Ion Collisions", G. Deco and R. Rivarola, *J. Phys. B: Atom. Mol. Phys.*, **22**, 1043, 1989.
- 19) "Ionization of Heavy Targets by Impact of Relativistic Projectile", G. Deco, P. Fainstein and R. Rivarola, *Nuclear Instruments and Methods*, **B35**, 100, 1988.
- 20) "Asymptotic Behavior of Distorted Wave Models for Ionization at Relativistic Energies", G. Deco and N. Grün, *J. Phys. B: Atom. Mol. Phys.*, **22**, 1357, 1989.
- 21) "Two Center Effects in Relativistic Radiative Electron Capture", G. Deco and R. Rivarola, *Phys. Rev. A*, **39**, 5451, 1989.

- 22) "Electron Capture and Ionization in Atomic Collisions", A. Martinez, G. Deco and R. Rivarola, Nuclear Instruments and Methods, **B43**, 24, 1989.
- 23) "An Approximate Description of the Double Capture Process in  $\text{He}^{2+} + \text{He}$  Collisions with Static Correlation", G. Deco and N. Grün, Z. Phys. D., **18**, 339-343, 1991.
- 24) "Capture from the Vacuum in Ion-Ion Collisions at Relativistic Energies", G. Deco and N. Grün, J. Phys. B: Atom. Mol. Phys., **22**, 3709, 1989.
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- 19) "A Neurodynamical Model of Visual Attention", G. Deco, E. Rolls, and J. Zihl, in *Neurobiology of Attention*, Eds.: L. Itti, G. Rees, and J. Tsotsos, Chapter **97**, pp. 593-599, Elsevier, Oxford, 2005.
- 20) "Computational Neuroscience and Cognitive Brain Functions", G. Deco, and E. Rolls, in *Intelligent Computing Everywhere*, Eds.: A. Schuster, pp. 153-170, Springer, London, 2007.
- 21) "Biased Competition and Cooperation: A Mechanism of Mammalian Visual Recognition", G. Deco, M. Stetter, and M. Szabo, in *Object Recognition, Attention, and Action*, Eds.: N. Osaka, I. Rentschler, and I. Biederman, pp. 187-203, Springer, Japan, 2007.
- 22) "Decision-Making Mechanisms in the Brain", G. Deco, and E. Rolls, in *Cooperative Behavior in Neural Systems (American Institute of Physics Conference Proceedings, 887)*, Eds.: P. Garrido, J. Marro, and J. Torres, pp. 21-28, AIP, USA, 2007.
- 23) "The Spiking Search over Time and Space Model (sSoTS): Simulating Dual Task Experiments and the Temporal Dynamics of Preview Search", E. Mavritsaki, D. Heinke, G. Humphreys, and G. Deco, in *Lecture Notes in Artificial Intelligence 4840: Attention in Cognitive Systems*, Eds.: L. Paletta, and E. Rome, pp. 343-356, Springer, Germany, 2008.
- 24) "Neuronal and Cortical Dynamical Mechanisms Underlying Brain Functions", A. Stemme and G. Deco, In *Handbook of Cognitive Science: An Embodied Approach*. P. Calvo and T. Gomila. Elsevier. Chapter 12, pp. 221-240, 2008.

- 25) "Neural Mechanisms of Visual Memory: A Neurocomputational Perspective", G. Deco and E. Rolls, In Visual Memory. S. Luck, A. Hollingworth. Oxford University Press. ISBN:978-0-19-530548-7, 2008.
- 26) "Vision - Computational Approaches", G. Deco and E. Rolls, In Encyclopedia of Neurosciences. M. Binder, N. Hirokawa, and U. Windhorst. Springer Verlag. Vol. 5, pp 4291-4295, 2009.
- 27) "Stochastic Dynamics in the Brain and Probabilistic Decision-making", G. Deco and E. Rolls, In Creating Brain-Like Intelligence: From Basic Principles to Complex Intelligent Systems. Bernhard Sendhoff, Edgar Koerner, Olaf Sporns, Helge Ritter and Kenji Doya. Springer Verlag, pp. 31-50, 2009.
- 28) "Stochastic Neurodynamical Computation of Brain Functions", G. Deco and E. Rolls, In Computational Modelling in Behavioural Neuroscience: Closing the Gap Between Neurophysiology and Behaviour. D. Heinke and E. Mavritsaki. Psychology Press, 2009.

## **D) International Conferences**

### **D-1) Publications in Atomic Physics**

- 1) "Symmetric Eikonal Calculations in Charge Exchange Ion-Atom", R. Rivarola, G. Deco and J. Maidagan, in VIII Conference on the Application of Accelerator in Research and Industry, North Texas State University, USA, 1984.
- 2) "Ultrarelativistic Electron Capture in Ion-Atom Collisions", G. Deco and R. Rivarola, in XIV International Conference on the Physics of Electronic and Atomic Collisions, Stanford University, USA, 1985.
- 3) "Relativistic Effects: CDW Approximations", G. Deco and R. Rivarola, in IX International Seminar on Ion-Atom Collisions, Flagstaff, Northern Arizona University, USA, 1985.
- 4) "Approximation Iconale Symetrique Pour L'echange de Charge aux Energies relativistes", G. Deco and R. Rivarola, in XI Colloque sur la Physique des Collisions Atomiques et Electroniques, Universite de Metz, France, 1986.
- 5) "Relativistic Distorted Wave Model for Charge Exchange", R. Rivarola and G. Deco, in IX Conference on the Application of Accelerator in Research and Industry, North Texas State University, USA, 1986.
- 6) "Relativistic Distorted Wave Model for Charge Exchange", G. Deco and R. Rivarola, in XV International Conference on the Physics of Electronic and Atomic Collisions, Brighton, England, 1987.
- 7) "Electron Capture Following Electron-Positron Pair Production in Relativistic Collisions", G. Deco and R. Rivarola, in XV International Conference on the Physics of Electronic and Atomic Collisions, Brighton, England, 1987.
- 8) "Mechanical Charge Exchange Processes in Relativistic Atomic Collisions", G. Deco and R. Rivarola, in X International Seminar on Ion-Atom Collisions, Bad Soden, Germany, 1987.
- 9) "Pair Creation as Intermediate Mechanism of Electron Capture", G. Deco and R. Rivarola, in X International Seminar on Ion-Atom Collisions, Bad Soden, Germany, 1987.
- 10) "K-Shell Electron Capture in Atomic Collisions", G. Deco and R. Rivarola, in XII Colloque sur la Physique des Collisions Atomiques et Electroniques, Caen, France, 1988.
- 11) "Electron Capture in Asymmetric Collisions by Impact of Light Projectile", A. Martinez, G. Deco and R. Rivarola, in XI International Conference on Atomic Collisions, Paris, France, 1988.
- 12) "Electron Ionization in Relativistic Atomic Collisions", G. Deco, P. Fainstein and R. Rivarola, in XI International Conference on Atomic Collisions, Paris, France, 1988.
- 13) "Positron Production with Electron Capture in Collisions Between Bare Heavy Ions", G. Deco and R. Rivarola, in SPIG 88, Sarajevo, Jugoslavia, 1988.
- 14) "Colisiones a Altas Energias con Producción de Pares Electrón-Positrón", G. Deco and R. Rivarola, in Encuentro Latinoamericano de Fisica Atómica, Brasil, 1988.

- 15) "Aplicación de un Modelo de Onda Distorsionada para Captura Electrónica en Colisiones Atómicas", A. Martínez, G. Deco and R. Rivarola, in Encuentro Latinoamericano de Física Atómica, Brasil, 1988.
- 16) "Relativistic Collisions with Pair Production", G. Deco and R. Rivarola, in IV International Workshop on Cross Sections for Fusion and other Application of Accelerator in Research and Industry, Texas A&M University, Texas, College Station, USA, 1988.
- 17) "Contribution of Different Mechanisms for Electron Capture at Relativistic Impact Energies", R. Rivarola and G. Deco, in X Conference on the Application of Accelerators in Research and Industry, North Texas State University, Texas, USA, 1988.
- 18) "Doppelladungsaustausch im Alpha-Helium Stößen im Hoch-Energiebereich", G. Deco and N. Grün, in Energiereiche Atomare Stöße, X Reunion Mittelberg, Austria, 1989.
- 19) "Double Electron Capture in Alpha-Helium Collisions at High Energies", G. Deco and N. Grün, in European Conference of Atomic and Molecular Physics, ECAMP 3, Bordeaux, France, 1989.
- 20) "First Order Perturbation Calculations of K-Shell Ionization in Relativistic Heavy Ion Collisions", G. Deco, K. Momberger, N. Grün and W. Scheid, in III European Conference of Atomic and Molecular Physics, Bordeaux, France, 1989.
- 21) "Pair Production in Ion-Ion Collisions at Relativistic Energies", G. Deco, N. Grün and R. Rivarola, in XVI International Conference on Physics of Electronic and Atomic Collisions, New York, USA, 1989.
- 22) "Relativistic Ionization in Ion-Atom Collisions", G. Deco, K. Momberger and N. Grün, in XVI International Conference on Physics of Electronic and Atomic Collisions, New York, USA, 1989.
- 23) "Pair Production in Relativistic Atomic Collisions", G. Deco, N. Grün and R. Rivarola, in XVI International Conference on Physics of Electronic and Atomic Collisions, New York, USA, 1989.
- 24) "Coulomb Perturbative Potentials in Distorted Wave Models", G. Deco, J. Maidagan, O. Fojon and R. Rivarola, in XIX International Conference on the Physics of Electronic and Atomic Collisions, Whistler, British Columbia, Canada, 1995.

## **D-2) Publications in Neural Networks**

- 25) "A Self-Organized Locally Tuned Network for Coarse Coding", G. Deco and J. Ebmeyer, in International Conference on Artificial Neural Networks, Ed. I. Aleksander and J. Taylor, pp. 87, Brighton, England, 1992.
- 26) "Supervised Learning for Decorrelated Gaussian Network", D. Obradovic and G. Deco, in International Conference on Artificial Neural Network, Springer Verlag, pp. 503, Amsterdam, Netherlande, 1993.
- 27) "Elimination of Overtraining by a Mutual Information Network", G. Deco, W. Finnoff and H. Zimmermann, in International Conference on Artificial Neural Network, Springer Verlag, pp. 744-749, Amsterdam, Netherland, 1993.
- 28) "Decorrelated Hebbian Learning for Gaussian Neurons", G. Deco and D. Obradovic, in World Congress on Neural Networks, vol. II, pp. 451-455, Oregon, USA, 1993.
- 29) "Unsupervised Elimination of Overtraining by a Mutual Information Criterion", G. Deco, W. Finnoff and H. Zimmermann, in World Congress on Neural Networks, vol. III, pp. 433-436, Oregon, USA, 1993.
- 30) "Capturing the Dynamic of Chaotic Time Series by Neural Networks", G. Deco and B. Schürmann, in Computational Learning and Natural Learning, CLNL, Provincetown, USA, 1993.
- 31) "Neural Networks for Industrial Process Control: Applications in Pulp Production", D. Obradovic, G. Deco, H. Furumoto and C. Fricke, in Neural Networks and Their Industrial and Cognitive Applications, pp. 25-32, Nimes, France, 1993.
- 32) "Handwritten Digit Recognition with PCA and RBF", G. Deco and R. Blassig, in International Joint Conference on Neural Networks, vol. 3, pp. 2253-2256, Nagoya, Japan, 1993.
- 33) "Self-Organization in Stochastic Neural Networks", G. Deco and L. Parra, in International Joint Conference on Neural Networks, vol. 1, pp. 479-482, Nagoya, Japan, 1993.
- 34) "A Stochastic Network with Rotor Neurons", L. Parra and G. Deco, in International Joint Conference on Neural Networks, vol. 2, pp. 1397-1400, Nagoya, Japan, 1993.
- 35) "Capturing the Dynamic of Chaotic Time Series by Neural Networks", G. Deco and B. Schürmann, in International Symposium on Nonlinear Theory and its Applications, vol. 4, pp. 1189-1193, Hawaii, 1993.
- 36) "Lernen von Dynamischen Invarianten von Chaotischen Reihen mit Neuronalen Netzen", G. Deco, in III. Jahrestagung: Chaos und Strukturbildung, Munich, Germany, 1993.
- 37) "Redundancy Reduction by Unsupervised Boltzmann Machines", G. Deco and L. Parra, in World Congress on Neural Network, vol. 4, pp. 229-233, San Diego, USA, 1994.
- 38) "Recurrent Learning of Chaotic Dynamic Systems", G. Deco and B. Schürmann, in World Congress on Neural Network, vol. 4, pp. 722-726, San Diego, USA, 1994.

- 39) "Linear Feature Extraction in Networks with Lateral Connections", D. Obradovic and G. Deco, in IEEE World Congress on Computational Intelligence, vol. 2, pp. 686-691, Florida, USA, 1994.
- 40) "Recurrent Neural Networks Capture the Dynamical Invariants of Chaotic Time Series", G. Deco and B. Schürmann, in *Neue Techniken der Informationsverarbeitung*, Ed.: M. Schlang, Renate Winkler Verlag, Munich, Germany, 1994.
- 41) "Unsupervised Modelling of Chaotic and Non-Chaotic Time Series", G. Deco and B. Schürmann, in *Neue Techniken der Informationsverarbeitung*, Ed.: M. Schlang., Renate Winkler Verlag, Munich, Germany, 1994.
- 42) "Principal Component Analysis: A Factorial Learning Approach", G. Deco and D. Obradovic, in International Conference on Artificial Neural Networks, Springer Verlag, vol. 2, pp. 1059-1062, Sorrento, Italy, 1994.
- 43) "Regularizing Stochastic Pott Neural Networks by Penalizing Mutual Information", G. Deco and T. Martinetz, in International Conference on Artificial Neural Networks, Springer Verlag, vol. 1, pp. 693-699, Sorrento, Italy, 1994.
- 44) "Higher Order Statistical Decorrelation without Information Loss", G. Deco and W. Brauer, in 39. Internationales Wissenschaftliches Kolloquium, vol. 2, pp. 197-205, Ilmenau, Germany, 1994.
- 45) "Redundancy Reduction by Unsupervised Boltzmann Machines", G. Deco and L. Parra, in 39. Internationales Wissenschaftliches Kolloquium, vol. 2, pp. 218-222, Ilmenau, Germany, 1994
- 46) "Inherent Information Flow in Chaos", G. Deco, in Dynamics and Control of Physical Systems, Cortona, Italy, 1995.
- 47) "Statistical Features Extraction" G. Deco and D. Obradovic, in Dynamics and Control of Physical Systems, Cortona, Italy, 1995.
- 48) "Unsupervised Neural Modeling of Chaotic Time Series", G. Deco and B. Schürmann, in World Congress on Neural Networks, vol. 1, pp. 322-325, Washington DC, USA, 1995.
- 49) "Linear Feature Extraction in non-Gaussian Networks" D. Obradovic and G. Deco, in World Congress on Neural Networks, vol. 1, pp. 523-526, Washington DC, USA, 1995.
- 50) "A New Penalty Term to Avoid Overfitting in Feed Forward Networks" C. Schittenkopf and G. Deco, in World Congress on Neural Networks, vol. 1, pp. 691-694, Washington DC, USA, 1995.
- 51) "Neural Learning of Chaotic Symbolic Sequences: A Dynamical Information Loss Analysis", C. Schittenkopf and G. Deco, in World Congress on Neural Networks, vol. 1, pp. 326-329, Washington DC, USA, 1995.
- 52) "Dual Statistical Mechanical Theory for Unsupervised and Supervised Learning" G. Deco and B. Schürmann, in Maximum Entropy and Bayesian Methods, Santa Fe, New Mexico, USA, 1995.

- 53) "Factorial Learning of Multivariate Time Series", J. Storck and G. Deco, in International Conference on Artificial Neural Networks, vol.1, pp.149-54, Paris, France, 1995.
- 54) "A Novel Pruning Method to Avoid Overfitting in Feed Forward Networks", C. Schittenkopf, G. Deco and W. Brauer, in International Conference on Artificial Neural Networks, vol. 2, pp. 437-42, Paris, France, 1995.
- 55) "Information Flow in Chaotic Systems", G. Deco, in International Conference on Complexity and Self-Organization, Berlin, Germany, 1995.
- 56) "Infomax and Redundancy Minimization in Linear and Non-Linear Architectures", G. Deco, in Interdisciplinary Workshop on Neural Networks, Würzburg, Germany, 1995.
- 57) "An Information-Theoretic Approach to Unsupervised Learning", G. Deco, in Workshop on Information Theory and Coding, Vail, USA, 1995.
- 58) "Evolution of the Uncertainty in Chaotic Systems: An Information Dynamics Approach", G. Deco, B. Schürmann and C. Schittenkopf, in International Symposium on Nonlinear Theory and its Applications, NOLTA-95, vol. 1, pp. 481-484, Las Vegas, USA, 1995
- 59) "A Characterization of the Intrinsic Information Loss in Single Humped Maps", C. Schittenkopf and G. Deco, in International Symposium on Nonlinear Theory and its Applications, NOLTA-95, vol. 1, pp. 489-491, Las Vegas, USA, 1995
- 60) "An Information-Theoretic Measure for the Classification of Time Series", C. Schittenkopf and G. Deco, in International Conference on Artificial Neural Networks, Lecture Notes in Computer Science **1112**, pp. 773-778, Bochum, Germany, 1996.
- 61) "Nonparametric Data Selection for Improvement of Parametric Neural Learning: A Cumulant-Surrogates Method", G. Deco and B. Schürmann, in International Conference on Artificial Neural Networks, Lecture Notes in Computer Science **1112**, pp. 121-126, Bochum, Germany, 1996.
- 62) "Training Data Selection by Detecting Predictability in Non-Stationary Time Series by a Surrogate-Cumulant Based Approach", G. Deco and B. Schürmann, in International Workshop on Neural Networks for Identification, Control, Robotics, and Signal/Image Processing, pp. 11-19, Venice, Italy, 1996.
- 63) "Information Flow in Chaotic Dynamics", G. Deco and B. Schürmann, in International Workshop on Neural Networks for Identification, Control, Robotics, and Signal/Image Processing, pp. 321-329, Venice, Italy, 1996.
- 64) "Detecting Higher Order temporal Correlations among the Spiking Events of a Group of Neurons", L. Martignon, G. Deco, K. Laskey and E. Vaadia, in Workshop on Neural Networks: From Biology to Hardware Implementations, Chia, Sardinia, Italy, 1996.
- 65) "Neuronale und informationstheoretische Methoden zur Analyse nichtlinearer dynamischer Systeme", G. Deco, in 2. Cottbuser Workshop: Aspekte Neuronalen Lernens, Cottbus, Germany, 1996.

- 66) "Modeling of Nonstationary Financial Time Series by Nonparametric Data Selection", G. Deco, R. Neuneier and B. Schürmann, in Fourth International Conference on Neural Networks in the Capital Markets, Pasadena, USA, 1996.
- 67) "Detecting Nonlinear Dynamics in Financial Time Series", C. Schittenkopf and G. Deco, in IEEE/IAFE Conference on Computational Intelligence for Financial Engineering, New York, USA, 1997.
- 68) "Testing Nonlinear Markovian Hypotheses in Dynamical Systems", G. Deco and C. Schittenkopf, in Fourth SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, USA, 1997.
- 69) "Unsupervised Learning for Blind Source Separation: An Information-Theoretic Approach", D. Obradovic and G. Deco, in ICASSP 97, International Conference on Acoustic, Speech, and Signal Processing, Munich, Germany, 1997.
- 70) "Dynamics Modelling in Brain Circulation", R. Silipo, C. Schittenkopf, G. Deco and A. Brawanski, in Neural Networks for Signal Processing VII, 162-169, Amelia Island, Florida, USA, 1997.
- 71) "Blind Source Separation: Are Information Maximization and Redundancy Minimization Different?", D. Obradovic and G. Deco, in Neural Networks for Signal Processing VII, pp. 416-425, Amelia Island, Florida, USA, 1997.
- 72) "EEG Dynamics and Brain Tumor Detection", R. Silipo, G. Deco and H. Bartsch, in Biomedical Engineering Society, Annual Fall Meeting, pp. 352, San Diego, USA, 1997.
- 73) "Blind Signal Separation Revisited", D. Obradovic and G. Deco, in 36th IEEE Conference on Decision and Control, San Diego, USA, 1997.
- 74) "Nonlinear Modelling of the Daily Heart Rhythm", R. Silipo, G. Deco, R. Vergassola, C. Schittenkopf and C. Gremigni, in International Conference on Artificial Neural Networks, Lecture Notes in Computer Science **1327**, pp. 1083-1088, Lausanne, Swiss, 1997.
- 75) "Dinamiche non lineari nello studio della variabilita' della frequenza cardiaca", R. Silipo, R. Vergassola and G. Deco, in XXIX Congresso Nazionale ANMCO (Associazione Nazionale Cardiologi Ospedalieri), Florence, Italy, Giornale italiano di cardiologia, **28** (2): 107 -P87, 1998.
- 76) "A Neural Network Based Markov Model of EEG Hidden Dynamics", R. Silipo, G. Deco and H. Bartsch, 3rd International Conference on: Neural Networks and Expert Systems in Medicine and Healthcare, NNESMED '98, pp. 58-66, Pisa, Italy, 1998.
- 77) "Markov models and HRV's hidden dynamics", R. Silipo, G. Deco, and R. Vergassola, Proc. of Computers in Cardiology, pp. 337-340, 1998.
- 78) "Nonlinear Markovian Dynamics of the Daily Heart Rhythm", G. Deco, in Workshop: Computational Tools and Industrial Applications of Complexity, Moscow State University, Moskau, Russland, 1999.

- 79) "Prediction and Noise Filtering in Dynamical Systems: A Neural Network Approach", G. Deco and L. Dubé, in Fifth SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, USA, 1999.
- 80) "A Novel Measure of Nonstationarity in Dynamical Systems", L. Dubé, F. Beaulieu and G. Deco, in Fifth SIAM Conference on Applications of Dynamical Systems, Snowbird, Utah, USA, 1999.
- 81) "Detection and Prediction of Epileptic Seizures: A Patient's Case Study", Verdes P., Deco G., Obradovic D., Dube L., Hopfengaertner R., Stefan H., Proceedings of the VI Argentine Congress on Computer Science, pp 1493-1503, Ushuaia, Argentina, 2000.

### **D-3) Publications in Computational and Cognitive Neuroscience:**

- 82) "An Information-Theoretic Analysis of Temporal Coding Strategies by Spiking Central Neurons", G. Deco and B. Schürmann, in International Conference on Artificial Neural Networks, Lecture Notes in Computer Science **1327**, pp. 73-78, Lausanne, Switzerland, 1997.
- 83) "Spatio-Temporal Coding in the Cortex", G. Deco, in Workshop on Neurostatistics and Cell Assemblies, Breckenridge, USA, 1997.
- 84) "Detecting Spatio-Temporal Patterns Among Groups of Spiking Neurons: A Frequentist Approach", L. Martignon and G. Deco, Workshop on Neurostatistics and Cell Assemblies, Breckenridge, USA, 1997.
- 85) "Spatial-Temporal Interactions within Groups of Neurons in Rat Somatosensory Cortex", L. Martignon, V. del Prete, G. Deco and M.E. Diamond, The 1998 Forum Meeting of European Neuroscience, Berlin, Germany, 1998.
- 86) "Comparing Different Measures of Spatio-Temporal Patterns in Neural Activity", G. Deco, L. Martignon and K. Blackmond Laskey, in International Conference on Artificial Neural Networks, Proceedings of the 8th ICANN (Springer Verlag), vol. 2, 943-948, Skövde, Sweden, 1998.
- 87) "Spike-Based Hebbian Learning for Stimulus Discrimination", J. Storck and G. Deco, in International Conference on Artificial Neural Networks, Proceedings of the 8th ICANN (Springer Verlag), vol. 2, 1057-1062, Skövde, Sweden, 1998.
- 88) "A Neuronal Model of Binding and Selective Attention for Visual Search", G. Deco and J. Zihl, 5th Neural Computation and Psychology Workshop, Connectionist Models in Cognitive Neuroscience, Birmingham, England, 1998.
- 89) "Spatio-Temporal Coding in a Cortical Network of Spiking Neurons", G. Deco and J. Storck, Workshop on "Temporal Coding: Is there evidence for it and what is its function?", Breckenridge, USA, 1998.
- 90) "Neurodynamical Mechanism of Binding and Selective Attention for Visual Search", G. Deco and J. Zihl, in Eight Annual Computational Neuroscience Meeting, Pittsburgh, USA, 1999.
- 91) "A Hierarchical Computational Model of Visual Attention Based in Feedback Enhancement of Spatial Resolution", G. Deco and J. Zihl, Cognitive Neuroscience Conference, Bremen, Germany, 1999.
- 92) "A Neurodynamical Model of Visual Attention: Feedback Enhancement of Spatial Resolution", G. Deco and J. Zihl, Workshop on "Visual Selection Mechanisms", Breckenridge, USA, 1999.
- 93) "Selective Attention in Visual Search via Synchronization of Phase Oscillators in a Multimodular Neural Network", S. Corchs and G. Deco, in Annual Meeting of the Cognitive Neuroscience Society, Supplement of the Journal of Cognitive Neuroscience, p. 89, San Francisco, USA, 2000.

- 94) "Selective Attention in Visual Search: A Neural Network of Phase Oscillators", S. Corchs and G. Deco, Ninth Annual Computational Neuroscience Meeting, Brugge, Belgium 2000.
- 95) "Temporal Clustering with Networks of Spiking Neurons and Dynamical Synapses", J. Storck, F. Jaeckel and G. Deco, Ninth Annual Computational Neuroscience Meeting, Brugge, Belgium, 2000.
- 96) "Biased Competition Mechanisms for Visual Attention in a Multimodular Neurodynamical System", G. Deco, in EmerNet: Third International Workshop on Current Computational Architectures Integrating Neural Networks and Neuroscience, Durham, England, 2000.
- 97) "A Neurodynamical Model of Visual Attention: Feedback Enhancement of Spatial Resolution in a Hierarchical System", G. Deco, in 3. Workshop "Dynamische Perzeption", Ulm, Germany, 2000.
- 98) "Attentional Enhancement of Spatial Resolution: A Neurodynamical Model", G. Deco and J. Zihl, in Workshop on "Action and Visuo-Spatial Attention: Neurobiological Bases and Disorders", Königswinter, Germany, 2000.
- 99) "Synchronization and Oscillatory Response in a Neural System for Object-Based Attention", N. Galm and G. Deco, Third European Biophysics Congress, Munich, Germany, 2000.
- 100) "The Dynamics of a Network of Spiking Neurons with Active Synapses", J. Storck, F. Jäkel, and G. Deco, Third European Biophysics Congress, Munich, Germany, 2000.
- 101) "The Computational Neuroscience of Visual Attention", G. Deco and J. Zihl, in Nineteenth European Workshop on Cognitive Neuropsychology, Bressanone, Italy, 2001.
- 102) "Visual Attention Mechanisms: Simulations of Basic Experimental Findings", S. Corchs, and G. Deco, Eight Annual Meeting of the Cognitive Neuroscience Society, New York, USA, 2001.
- 103) "The Computational Neuroscience of Visual Attention", G. Deco and J. Zihl, 4. Tübinger Wahrnehmungskonferenz, Tübingen, Germany, 2001.
- 104) "Biased Competition Mechanisms for Visual Attention", G. Deco and J. Zihl, 4th Meeting of the German Neuroscience Society - 28th Göttingen Neurobiology Conference, p. 268, Göttingen, Germany, 2001.
- 105) "A Neurodynamical Model for Visual Attention: Description of fMRI Experimental Data", S. Corchs and G. Deco, 4th Meeting of the German Neuroscience Society - 28th Göttingen Neurobiology Conference, p. 267, Göttingen, Germany, 2001.
- 106) "Simultaneous Parallel Processing of Object and Position by Temporal Correlation", L. Lago-Fernandez and G. Deco, 6th International Work-Conference on Artificial and Natural Neural Networks, Biological and Artificial Computation: Methodologies, Neural Modeling and Bioengineering Applications, Granada, Spain, 2001.
- 107) "A Neurodynamical Model to Simulate Neural Activities in Visual Attention Experiments", S. Corchs and G. Deco, Tenth Annual Computational Neuroscience Meeting, San Francisco & Pacific Grove, USA, 2001.

- 108) "A Unified Model of Spatial and Object Attention Based on Inter-Cortical Biased Competition", G. Deco and T.S. Lee, Tenth Annual Computational Neuroscience Meeting, San Francisco & Pacific Grove, USA, 2001.
- 109) "A Computational Neuroscience Account of Visual Neglect", G. Deco, D. Heinke, J. Zihl, and G. Humphreys, Tenth Annual Computational Neuroscience Meeting, San Francisco & Pacific Grove, USA, 2001.
- 110) "Speech Recognition with Spiking Neurons and Dynamics Synapses: A Model Motivated by the Human Auditory Pathway", C. Naeger, J. Storck, and G. Deco, Tenth Annual Computational Neuroscience Meeting, San Francisco & Pacific Grove, USA, 2001.
- 111) "A model of binocular rivalry based on competition in IT", L. Lago-Fernández and G. Deco, Tenth Annual Computational Neuroscience Meeting, San Francisco & Pacific Grove, USA, 2001.
- 112) "A Neurodynamical Model of Spatial and Object Attention Based on Inter-Cortical Biased Competition", G. Deco and T. Lee, Society for Neuroscience Abstract, Vol. 27, Program No. 349.4, SFN 31st Meeting in San Diego, USA, 2001.
- 113) "Object Specific Enhancement Effect in Neuronal responses of Macaque Primate Visual Cortex", T. Lee, Q. Haijang, C. Yang and G. Deco, Society for Neuroscience Abstract, Vol. 27, Program No. 417.15, SFN 31st Meeting in San Diego, USA, 2001.
- 114) "The Neurodynamics of Spatial and Object Attention", G. Deco, International Workshop on "The Mathematical, Computational and Biological Study of Vision", Oberwolfach, Germany, 2001.
- 115) "Neurodynamical Modelling of Attentional Top-down and Graded Lateral Local Inhibition Effects on fMRI and Single-cell Experiments", G. Deco, E. Rolls, and J. Zihl, 5. Tübinger Wahrnehmungskonferenz, Tübingen, Germany, 2002.
- 116) "Neurodynamical Mechanisms Underlying Visual Attention", G. Deco, II. Sino-German Advanced Workshop in Cognitive Neuroscience and Psychology, Munich, Germany, 2002.
- 117) "A Neurodynamical Cortical Model of Visual Attention and Invariant Object Recognition", G. Deco and E. Rolls, Abstract n. 124.9, 3rd Forum of European Neuroscience, Paris, France, 2002.
- 118) "Visual Attention EEG Correlates at Global and Local Levels of Figure Identification", A. Yorio, G. Deco, D. Burin, C. Marro and E. Segura, Abstract n. 108.16, 3rd Forum of European Neuroscience, Paris, France, 2002.
- 119) "A Neurodynamical Theory of Visual Attention: Comparisons with fMRI- and Single-Neuron Data", G. Deco and E. Rolls, in International Conference on Artificial Neural Networks, Proceedings of the 12th ICANN, Lecture Notes in Computer Science, LNCS 2415, Ed. J. Dorrnsoro (Springer Verlag), 3-8, Madrid, Spain, 2002.

- 120) "Neurodynamical Modeling of Visual Cognition: Attention and Working Memory", G. Deco, in Workshop on System Level Modeling (Organizers: B. Horwitz and J. Miller), Mathematical Bioscience Institute, The Ohio State University, Columbus (Ohio), USA, 2002.
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