Curriculum Vitae

Dr. Charles Clyde Peck III

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PROFILE:

A recognized leader in both organizational management and technical expertise with demonstrated excellence across a broad range of technical and scientific disciplines and a history of identifying and successfully solving critical, exceptionally challenging problems. Areas of expertise include:

Neuroscience, cognitive science, simulation and computational modeling, machine learning, imaging, software systems architecture, computer science, high performance computing, systems engineering, statistics, mathematics, physics, optimization, analog and digital electronics design

EDUCATION:

- **Ph.D., Electrical Engineering,** University of Cincinnati, Cincinnati, OH (1993)
  Doctoral dissertation: "Analysis of Genetic Algorithms from a Global Random Search Method Perspective with Techniques for Algorithmic Improvement."
  Dissertation contributions: Critique of existing genetic algorithm theory; proposal of alternative theory, numerous algorithmic enhancements and theoretical insights; application to neural net input selection, training and generalization; application to Space Shuttle Main Engine sensor fusion and fault detection.
  Academic and research concentrations: genetic algorithms, biological and artificial neural systems, cognitive modeling, AI, image processing, medical imaging, computer vision, signal processing
- **M.S., Electrical Engineering,** University of Cincinnati, Cincinnati, OH (1991)
  Master's thesis: "Implementation and Analysis of an Efficient Cone-Beam Reconstruction Method."
  Thesis contributions: Review of cone-beam tomography reconstruction prior art, proposal of highly efficient and effective artifact reduction technique, supercomputer implementation of novel reconstruction and artifact reduction techniques, experimental evaluation of simulated results.
- **B.S., Electrical Engineering,** Florida Atlantic University, Boca Raton, FL (1986)
  Senior project: Portable LCD and microcontroller-based EKG monitor
- **A.A.,** University of Florida, Gainesville, FL (1984, requested/granted 1986)
  Program: Freshman Honors Program

PROFESSIONAL DEVELOPMENT:

- Compliance training over many years (workplace environment, diversity, export control, government contracting, ethics, digital security, business conduct, etc.)
- Intellectual property seminars on laws and development (every 1-2 years)
- Frequent seminars on leading edge research across domains (neuroscience, computational biology, artificial intelligence, supercomputing, mathematics, optimization, computer science, electrical engineering, statistics, computer vision, software methodologies, chemistry, nanotechnology, MEMS, business modeling, supply chain and ERP, issues in medical, energy, financial and other industries, etc.)
- Personal Branding, Spring 2013
- IBM's MicroMBA, Spring 2011
- LEADing@IBM Professional Management: Giving Feedback, Spring 2007
- LEADing@IBM Employee Development: A Meaningful Dialogue, Spring 2007
- Basic Blue Management Training, Spring 2002
- Action Writing Skills, Spring 2000
- Personal Negotiation Skills, Spring 2000
- Senior Assessment & Development Institute, April 1998

- Project Leadership Course, September, 1997
- New Leader Development Program, April–August, 1997
- Object Oriented Analysis & Design, June, 1996
- Business Development, November, 1995
- Systems Engineering, September, 1995
- ClearCase Training, 1994
- ObjectStore Training, 1994

EXPERIENCE:

NeuroMentix, LLC, Newtown, CT 7/13–Present
Positions: President, Chief Scientist, Founder
Responsibilities: Business management, business development, research and development, consulting
Accomplishments: Launched and managed NeuroMentix; secured research funding from DARPA and the Army Research Office to develop a new class of autonomous artificial intelligence technology closely modeled after the vertebrate brain and capable of solving the types of problems that are easy for humans and animals, but are beyond the capabilities of computers today; hired a research scientist; led the research and the design and development of a simulated automaton and its environment for training, testing and evaluating the technology; provided neuroimaging, cognitive science, and game design consulting services to a major research university and its industry partner, including writing the image analysis protocol for a proposal to a government research organization; administered all HR and back office functions, including contracts, the 401k, healthcare, and insurance benefits, DCAA accounting processes and audits, business and worker's compensation insurance, regulatory compliance, finance, intellectual property, and other functions.

IBM Research, T.J. Watson Research Center, Yorktown Heights, NY, 3/99–7/13
Positions: Manager/Team Leader, Biometaphorical Computing Research, 6/01–7/13, Research Staff Member, 3/99–7/13
Overall responsibilities:
- *Leadership:* Project and technical leadership; principal investigator; project review; strategy development; relationship manager with research collaborators, customers, and internal groups; demonstrations and briefings; marketing support; customer interactions; media relations; personnel development and management; mentoring; contract negotiations; task force participation
- *Technical:* Research planning and execution in the areas of neuroscience, neuroinformatics, simulation systems, modeling, cognitive systems, artificial intelligence, machine learning, imaging, and information theory; mathematical and statistical analysis; system engineering and requirements analysis; software architecture analysis and design for high performance computing platforms; software development; intellectual property development; consulting; technical writing; web site design

Key accomplishments:
- *Leadership:* Initiated and led IBM's neuroscience, neuroinformatics, and cognitive science research program for 12 years producing numerous contributions to science and technology, including the related areas of simulation systems, machine learning, and neuroimaging; established multiple international research collaborations; recognized with a Research Division Accomplishment for contributions to the establishment of U. Melbourne for Victoria Life Sciences Computation Initiative; served as "Technical Resource" with contributions to task forces, corporate initiatives, Global Technology Outlooks, IBM Academy studies covering computer science, neuroscience, cognitive science, artificial intelligence, intellectual property, and computing technology; served on external boards and committees; initiated and participated in organizational strategy efforts at multiple levels; formed research team and aggressively pursued employee development; provided marketing support through customer interactions, facilitating $10-100M in deals; represented IBM's neuroscience research efforts in the media and IBM advertising
- *Technical:* Computational and mathematical models of large scale neural systems from neurons to microcircuits, tissues, brain structures, systems, global brain function and automata with varying degrees of biological fidelity and abstraction; a theoretical brain model explaining much of perception, behav-

ior generation, learning, and subjective experience; a computational theory of emotion; analysis of neuroscientific data; design and development of sophisticated simulation environments running on high performance computing platforms; contributions to the Blue Gene Supercomputer; development of machine learning techniques; proposal and development of HRRT PET software for machine interface, reconstruction, and artifact reduction; contributions to the concepts of operation, architecture, knowledge representation and knowledge engineering methodology for an interactive document configuration system leading to customer acceptance; conception and design of an interactive, annotated reading tool; invention of computer peripherals, including eye gaze tracking technology and keyboards

Areas of research:

- **Theory-driven Modeling**, 12/00–7/13
  Area summary: Computational or mathematical modeling of neural systems and automata using biological abstractions to enable biological capabilities and functional understanding.
  Key projects: Global brain modeling, emotion modeling, system level cerebellum modeling, STDP effects on network function, cortical map formation, cortical dynamics, adult neurogenesis, pain, and the Biometaphorical Computing Adventurous Research project.
  Accomplishments: A network theory for global brain function, grounded in threat avoidance, causal modeling constraints, and self-referential categorization, that explains a wide range of brain phenomena, including self-inference, certain perceptual and mental qualia, objective driven behavior, and learning; a computationally grounded theory of emotion; globally integrated model of the cerebellum explaining learning and behavioral capabilities; an Infomax-based topographic, self-organizing cortical map model; a recognition automaton; and multiple team contributions related to pain, adult neurogenesis, cortical dynamics, and STDP. Pubs: 16 personal, 11 team. Patents: 1 granted, 1 pending.
- **Data-driven Modeling**, 05/05–7/13
  Area Summary: Highly detailed, carefully validated, computational modeling of neural tissue to replicate experimental phenomena, understand tissue function, and make scientifically testable predictions.
  Key projects: The IBM/EPFL Blue Brain project (BBP) to produce a high fidelity model of the neocortical column running on an IBM Blue Gene/L supercomputer; an experimentally validated inferior olive/cerebellum model (IO); generative models of neuron morphologies; and ion channel modeling.
  Accomplishments: Established participation in the BBP, negotiated IBM's role, and directed IBM's scientific and technical contributions, including key contributions: model parameterization and optimization techniques, model validation strategies, experimental design, touch detection of neural processes, and software analysis, design, and development; co-established an international IO modeling collaboration and directed development of a detailed model with unique gap junction and axon dynamics capabilities; oversaw development of computational techniques to reproduce dendritic morphologies and ion channel models; mentored the principal investigator and two interns; contributed machine learning techniques and design guidance for function approximation techniques applied to ion channel currents. Pubs: 2 personal, 6 team. Patents: 1 pending.
- **Neuroscientific Analysis**, 05/05–7/13
  Area summary: Exploit high performance computing and novel, paradigm shifting analysis techniques to generate new insights and usable, interpretable information.
  Key projects: Cortical color representation, fMRI analysis for disease markers, pain, ADHD, and causal relationships; ECoG/EEG/microelectrode analysis; connectomics; language and behavior
  Accomplishments: Established multiple research collaborations; team recognized with IBM Research Accomplishment for "Network Analysis for Complex System Understanding and Classification;" pioneering contributions in the application of statistical network theory to the analysis of fMRI, ECoG, EEG, and language for classification, prediction, and understanding of brain and psychological phenomena; pioneering contributions in the application of autoregressive modeling and analysis of fMRI. Pubs: 2 personal, 32 team.
- **Neuroimaging,** 08/09–7/11
  Area summary: Exploit high performance computing to expand the range of feasible algorithms, to improve image reconstruction quality, and to tailor techniques to the scientific questions pursued.
  Key projects: HRRT PET reconstruction and corrections; high speed fMRI and compressed sensing; electron microscopy segmentation; ultramicroscopy

Accomplishments: Established a research collaboration with a strategic partner, satisfying a Research Division milestone; analyzed the HRRT PET machine and identified numerous approaches to increase spatiotemporal accuracy and reduce artifacts; developed a technique to exploit and correct subject motion using detected events; developed and demonstrated HRRT PET software leading to new reconstruction technique exploiting a priori information; proposed additional novel techniques for 4D reconstructions; worked with a research collaborator to identify techniques to improve ultramicroscopy resolution; oversaw team research into the use of compressed sensing to improve fMRI temporal resolution and projects to segment electronmicrographs of neuropil. 1 patent publication.

- **Machine Learning and Statistical Analysis Techniques**, 05/05–7/13
  Area summary: Develop machine learning and statistical analysis techniques inspired by neuroscience or tailored to the magnitude, high dimensionality, and complexity of neuroscientific data.
  Key projects: Sparse regression, Markov random fields, dimensionality reduction, novel classifiers
  Accomplishments: Development of a simple classifier producing the probability of class membership; and team development of sparse regression techniques for making brain state predictions in spatio-temporal networks, MRF models of statistical relationships between spatially distributed, dynamical brain elements, Bayesian techniques for setting the MRF sparsification paramater, and development of algorithms for supervised dimensionality reduction. 13 team publications.
- **Simulation Environments and Software Infrastructure**, 06/01–7/13
  Area summary: Develop tools that make it easy to exploit high performance computing platforms for complex neuroscientific analysis and for large scale neural system modeling.
  Key projects: Model-Graph Simulator, Neural Tissue Simulator, touch detection analyzer, Octave on Blue Gene, GPU-based analysis
  Accomplishments: Member of the IBM Blue Gene Supercomputer team receiving the National Medal of Technology (I contributed requirements and scientific applications); led the architecture and development for the Model-Graph Simulator (MGS), an MPI-based, multi-threaded, distributed time step simulation environment with a declarative specification language for composing models with arbitrary interfaces in a fixed interaction network and a model definition language for automated code generation; ported the MGS to Blue Gene to satisfy a Research Division milestone; oversaw team contributions of the Neural Tissue Simulator, a scalable, MGS-based compartmental neuron modeling environment able to model arbitrarily large neural tissues, uniquely including gap junctions and complex axonal phenomena; a Blue Gene-based neuron touch detection system to analyze and configure massive neural tissue models; a port of Octave to Blue Gene for parallel computation in a Matlab-like environment; and porting of neuroinformatics code to GPUs for performance comparison with P-Series processors. Pubs: 3 personal, 3 team
- **Interactive Document Configuration,** 3/99–12/00
  Area summary: Develop interactive document configuration concepts, technologies, methodologies, and intellectual property and deploy the application and supporting infrastructure within IBM.
  Key project: Software Architecture, Logic And Reasoning Program (SOALAR), which used constraint-based reasoning as the driving artificial intelligence technology
  Responsibilities: Technical leadership, analysis and design, system engineering, research, demonstration and engagement support, mentoring, and relationship management.
  Accomplishments: Led analysis, proposed numerous enhancements and conceptual changes to the concepts of operation; led changes to the software architecture resulting in a faster, simpler, more extensible, capable and implementable design, more general document representation, an undo/redo architecture, and XML changes; proposed key enhancements to the knowledge representation and rule/constraint language, developed a knowledge engineering methodology and applied it to template analysis and development; provided extensive user interface review, feedback, recommendations, and usability solutions; provided planning, logistics, quality assurance, and review for all major events and engagements; managed relationships with internal and corporate partners
- **Interactive Reading Tools**, 6/99–11/99
  Area summary: Develop new tools and techniques to make reading text on computer screens easier and more natural and to improve comprehension, understanding, and reading performance
  Key project: Reading Assistance Displays (READ)
  Responsibilities: Principal investigator, technical & project leadership, and intellectual property

Accomplishments: Initiated project; developed key concepts and concepts of operation; designed and led development of modular, highly extensible component framework and test bed; led development of prototype components; mentored summer intern; successful demonstration and review

Columbia University, New York, NY, 8/06–12/08
Position: Assistant Adjunct Professor, Electrical Engineering Department
Responsibilities: Developed and co-taught the graduate level course: "Global Brain Modeling." The course was offered the fall sessions of 2006, 2007, and 2008
Major accomplishments: The course was so popular in its first year that it was also offered as an online, video course. Each year, I received very positive reviews, with some students indicating it was the best course they've ever taken.

Lockheed Martin—Advanced Technology Laboratories, Camden, NJ, 1/96–3/99
Positions: Technical leader/Manager, Advanced Distributed Architecture Research, 1/97–3/99; Principal Member of the Engineering Staff, 1/96–1/97
Overall responsibilities: Software architecture and algorithm design; rapid prototyping; program management and technical leadership for planning and executing $1–2M in applied research programs/year; write proposals and support new business development; interface with customers and technical community in technical and programmatic capacities; manage team and conduct employee performance reviews
Key accomplishments: Recognized as technical resource for object-oriented architecture analysis and design, component-based application frameworks, distributed object technologies, and modeling & simulation; primarily responsible for winning $6.5M in new business (DDB, IDEX/CIIF, and ATIRP programs); led development of multiple system prototypes; designed the Geospatial Information Access Specification (GIAS), which was adopted by National Imagery and Mapping Agency (NIMA) as the baseline architecture; recognized with many awards, including Lockheed Martin's highest award: the NOVA Award for Technical Excellence.
Primary projects:

- **Adv. Telecommunications & Information Distribution Research Program (ATIRP)**, 2/97–3/99
  Project summary: Design and develop technologies to enable information dissemination over contended, dynamic network configurations based upon tactical requirements.
  Responsibilities: Program management, technical lead and principal investigator for architectural analysis, distributed algorithm design, implementation, & analysis, and system development.
  Accomplishments: Conducted study and developed CORBA-compliant, object-oriented architecture for simulation enhanced situation awareness; developed distributed, scalable algorithm for network decongestion; effective technical program management, planning, and reporting;
- **IDEX/CIIF Prototype Implementation**, 12/96–3/99
  Project summary: Design and develop a CORBA-based interface to the Lockheed Martin IDEX system that is compliant with the NIMA Common Imagery Interoperability Facility (CIIF).
  Responsibilities: Program management, technical lead and principal investigator for architectural analysis, system development, and CIIF analysis.
  Approach: Initiated and led a rapid prototyping effort; participated in CIIF standards meetings; advocated for more extensible architecture, which became necessary with the CIO and DMA merge into NIMA; proposed GIAS architecture
  Accomplishments: Effective technical program management, planning, and reporting leading to a CORBA-compliant, object-oriented architecture and software implementation of a prototype CIIF-compliant IDEX interface. This work was recognized with a LM-ATL "Special Recognition Award." Designed & proposed the Geospatial Information Access Specification (GIAS), which was adopted by NIMA as the baseline architecture. This work was recognized with LM-ATL's highest honor: "Award of Distinction."
- **IS2000,** 1/96–2/97
  Project summary: A CORBA-compliant product dissemination system for distributing intelligence products over contended resources, according to mission requirements and organizational policies.
  Responsibilities: Technical program management, technical lead and principal investigator for the architecture, algorithm development, and policy-based system management.

Accomplishments: CORBA-compliant, object-oriented architecture; a scalable, distributed scheduling, planning, and decongestion algorithm; a policy-based system management; participation in NIMA's Common Imagery Interoperability Facility standardization process; effective technical management and planning, timely reporting

TASC (The Analytical Sciences Corporation), Arlington, VA, 12/93–1/96
Position: Senior Staff Member
Overall responsibilities: Object-oriented analysis, design, and programming using C++ of distributed, integrated simulation system technologies, consulting, customer briefings and demonstrations
Key accomplishments: Disproportionate impact by identifying, designing, and implementing solutions for numerous critical elements of the SimCore system that were deferred due to ambiguity and difficulty. Developed the Federated Object Model development process, led technology development and integration, influenced the Object Model Template working group. Technical resource for C++ and object-oriented design expertise. Requests for consulting across projects and selection by the customer to join the ARPA Synthetic Theater of War (STOW) program. Initiated paper on the application of object-oriented technologies for distributed, interactive simulations, leading to selection for a plenary session presentation.
Primary projects:

- **ARPA Synthetic Theater of War (STOW) Systems Eng. & Integ. Demo. (SEID),** 8/95–1/96
  Project summary: Integrate STOW Advanced Distributed Simulation family programs (AMG HLA, RTI, synthetic environments, synthetic forces, infrastructure…) into the STOW '97 demonstration.
  Responsibilities: Task lead for the Federation Object Model (FOM) Integration
  Approach: Requirements analysis and analysis of interoperability and reuse issues; coordination with the Architecture Management Group's Object Model Template (OMT) working group and across STOW teams to facilitate consensus on FOM-related approaches and technologies
  Accomplishments: Developed STOW SEID's FOM development process, specified and led development of technologies for FOM use and integration, integrated the approach into the exercise development and documentation processes, influenced development of the OMT through the working group
- **ARPA War Breaker, SimCore,** 12/93–8/95
  Project summary: Development of SimCore, a distributed, interactive, simulation (DIS) environment
  Responsibilities: Object-oriented design and programming using C++, task lead for the entity architecture, consulting to other projects, user point of contact, customer briefings
  Approach: I mastered the existing architecture, identified the critical areas that were deferred due to ambiguity and difficulty, and designed and implemented solutions.
  Accomplishments: Object-oriented entity architecture, modeling API, code generation specifications, scenario generation and initialization, dynamic types and data marshalling, DIS PDUs and infrastructure, data collections and analysis architecture. Asked to consult on other projects. Initiated and co-wrote paper on applications of object-oriented architecture to DIS, which was selected for plenary session presentation. Received "Most Significant Contribution Award" from SAIC, TASC's customer.

University of Cincinnati, Cincinnati, OH, 6/88–12/93
Positions: Research Assistant (6/89–12/93), Teaching Assistant (6/88–6/89)
Overall responsibilities: Research, mathematical and statistical analysis, system and scientific programming, experimentation, technical writing, and assisting students
Key accomplishments: A mathematically rigorous theory for genetic algorithms; sophisticated software system for genetic algorithm applications, neural network optimization, VCR control and frame grabber level signal processing, and cone-beam tomography reconstructions; applied these to automatically produce results that exceeded those of experts; produced 4 journal and 7 conference papers.
Primary projects:

- **Fault Detection and Estimation of Space Shuttle Main Engine (SSME) Sensors**
  Responsibilities: Develop a neural network to predict SSME health given 218 sensor measures
  Approach: Proposed genetic algorithm for systematic input selection, applied neural networks for prediction of sensor values and sensor fusion, wrote suite of programs for processing raw test firing data, wrote object-oriented genetic algorithm and neural network libraries (>15,000 lines of code).

Accomplishments: Developed a mathematically rigorous theory for genetic algorithms leading to algorithmic enhancements, developed reusable, sophisticated object oriented software, produced a sensor list that outperformed one produced by a panel of experts, produced 1 journal and 3 conference papers

- **Plume Diagnostics of the SSME**
  Responsibilities: Develop 4D visualization of SSME plume emissions recorded on videotape
  Approach: wrote subroutine library for hardware-level control of frame grabber and VCR, wrote general purpose image acquisition, registration, and analysis sofware, performed plume visualization on a PIXAR imaging computer, wrote programs for multi-dimensional analysis of plume structures
  Accomplishments: Demonstrated the feasibility of NASA's plume diagnostics strategy, developed a production analysis pipeline, eliminated original target signal as a candidate through highly accurate registration, produced 1 journal and 1 conference paper
- **Three-Dimensional Cone-Beam Tomography**
  Responsibilities: Analyze, implement, and improve a novel 3D cone-beam reconstruction algorithm
  Approach: Developed novel artifact reduction techniques from mathematics analysis, implemented novel cone-beam reconstruction algorithms on a Cray Y-MP supercomputer, and developed programs for the display, analysis, and manipulation of data sets.
  Accomplishments: Characterized the accuracy and efficiency of the novel technique, showed improved performance with my proposed artifact reduction technique, developed novel Fourier domain interpolation technique for medical images, produced 1 journal and 2 conference papers
- **Teaching assistant for an introductory electronics course**
  Responsibilities: Conducted a problem solving and discussion section, supervised a microprocessor lab
  Accomplishments: Successfully assisted students and met all requirements of the position

Consulting Engineer to KBS, Incorporated, Deerfield Beach, FL, 5/92–9/92
Responsibilities: Transmission line analysis and electronic design
Major accomplishments: Two novel SCSI transceiver designs, a patent application and a technical paper

KBS, Incorporated, Coral Springs, FL, 10/86–9/88
Position: Design Engineer
Responsibilities: Analog and digital product conception, design, and development; software design and development; mechanical design; customer consultations & support; all technical writing, reports, & manuals
Major accomplishments: Designed two gate arrays; developed three fiber optic transceivers, two RS-232 multiplexers (one was on the market for 20+ years), a printer buffer, an RF robotic controller, and automated test equipment; helped KBS grow from 3–30 people

COMPUTING SKILLS:
Languages: C/C++, Matlab, Java, Python, FORTRAN, BASIC, assembler.
Software Engineering: MPI, Flex, Bison, CORBA IDL, TotalView, CVS, ZeroFault, Iona Orbix (CORBA), ObjectStore (ODBMS), Rogue Wave STL, Tool.h++, ClearCase, Sun Workshop, SparcWorks, Paradigm Plus, OMT STP, Purify, etc.
Platforms and OS's: IBM P-series: AIX; IBM Blue Gene: Linux; Sun: BSD Unix, SunOS, Solaris; SGI: IRIX; Cray: UNICOS; IBMPC: Linux, Windows, MS-DOS; MacIntosh: Sys. 7/8; DEC VAX: VMS; Pixar

HONORS & AWARDS:
- IBM Thanks! Award for contributions to the Summer Internship program, 2012
- IBM "Research Division Accomplishment" for contributions to the establishment of the University of Melbourne for Victoria Life Science Computation Initiative, 2011
- Chosen at VP level to participate in the selective IBM MicroMBA course, Spring 2011
- National Medal of Technology presented to IBM for the Blue Gene Supercomputer by Obama, November 2009. My contributions were system requirements and scientific applications.
- IBM "Research Division Accomplishment" for "Network Analysis for Complex System Understanding and Classification," 2009
- Peer-to-Patent Appreciation Award for patent analysis contributions cited by the USPTO, 2009
- IBM Thanks! Award for analysis of and contributions to the Peer-to-Patent web site design, 2008

- Designated as a "Technical Resource" by IBM, 2006
- "Bravo! Night on the Town" Award for Successful Project Leadership, IBM Research, February 2003
- "Bravo! Night on the Town" Award for SOALAR contributions, IBM Research, December 1999
- Designated as a "World Class Hire" by IBM Research, 1999
- National Academy of Engineering's 1999 German/American Frontiers of Engineering, among 35 engineers selected from previous NAE FOE Symposia participants to represent the United States
- National Academy of Engineering's 1998 Frontiers of Engineering Symposium[1], among 83 engineers selected nationwide for "an annual event intended to bring together some of the nation's top engineers"
- NOVA Award — Technical Excellence, Lockheed Martin's Highest Honor, for SW architectures,1998
- Award of Distinction, Lockheed Martin - Advanced Technology Laboratories' Highest Honor, 1997
- Special Recognition Award, Lockheed Martin - Advanced Technology Laboratories, December 1997
- Most Significant Contribution Award, presented by TASC's customer, SAIC, May 1994

Academic:

- Received a Fellowship from NASA's Space Engineering Center for System Health Mgmt. Technology
- Received a University Graduate Scholarship on a competitive basis
- Inducted into Tau Beta Pi Assoc., National Engineering Honor Society, Florida Atlantic University
- Recognized in Dean's List multiple times, Florida Atlantic University
- Accepted into Freshman Honors Program, University of Florida

BOARDS, WORKSHOPS, ADVISORY ROLES, and ORGANIZING COMMITTEES:

- Advisory Board, BRAIN-Code, Ontario Brain Institute, Toronto, 2012–Present
- External Advisory Board, Neuroinformatics Doctoral Training Centre at the University of Edinburgh, 2006-Present
- Industry Advisory Panel , Rutgers Discovery Informatics Institute, 2012
- 1st INCF Workshop on Large-scale Modeling of the Nervous System, Stockholm, December, 2006
- National Academy of Engineering's 2003 Japanese/American Frontiers of Engineering Organizing Committee, selected as the American co-organizer for the Multimedia Networking session, August 2003
- Subject matter expert advising on computational neuroscience programs, Jülich Supercomputing Centre, Jülich, Germany, 2011, 2012, 2013
- National Academy of Engineering's 2002 Japanese/American Frontiers of Engineering Organizing Committee, selected as the American co-organizer for the Pervasive Computing session, August 2002

CONFERENCE SESSION CHAIRS, TASK FORCES, and PROGRAM COMMITTEES:

- IEEE Symposium Series on Computational Intelligence (SSCI) program committee: 2013
- Invited participation in Task Force on "Towards Human-like Intelligence": 2013
- Nature and Biologically Inspired Computing (NaBIC) program committee: 2011, 2012
- Biologically Inspired Cogntive Architectures (BICA) program committee: 2011, 2012
- Session Chair, "Emotions in BICA, in humans and artifacts," BICA 2011
- IEEE Workshop on Biomedical Applications for Digital Ecosystems, 2007
- IEEE Joint Conference on Neural Networks (IJCNN) 2006, 2011-2013
- Invited reviewer for multiple journals and other conferences.

AFFILIATIONS:

- Biologically Inspired Cognitive Architectures (BICA) Society
- Society for Neuroscience
- Institute of Electronics and Electrical Engineers (IEEE), Computer Society
- Association for Computing Machinery (ACM)
- Tau Beta Pi Association, National Engineering Honor Society

PATENTS:

[1] See http://www.nae.edu/nae/nae.nsf/NAE+Programs/US+Frontiers+of+Engineering?OpenDocument

Granted:

1. Title: Eye Gaze Control of Dynamic Information Presentation
   Patent Number: US 6,886,137
   Inventors: Charles Peck, John D. Mackay
   Assignment: IBM
2. Title: Gesture Sensing Split Keyboard and Approach for Capturing Keystrokes
   Patent Number: US 6,630,924
   Inventors: Charles Peck
   Assignment: IBM
3. Title: Method for Increasing the Signal to Noise Ratio in IR-based Eye Gaze Trackers
   Patent Number: US 6,959,102
   Inventors: Charles Peck
   Assignment: IBM
4. Title: Methods and Apparatus for Transmitting Signals through Network Elements for Classification
   Patent Number: US 7,287,015
   Inventors: Guillemro Cecchi, James Kozloski, Charles Peck, Ravishankar Rao
   Assignment: IBM
5. Title: Establishing Relationships Between Components In Simulation Systems
   Patent Number: US 7,756,691
   Inventors: Derek Carey, A. Ravishankar Rao, James Kozloski, Charles Peck
   Assignment: IBM

Published:

1. Title: Reconstruction of Images Using Sparse Representation
   Inventors: Rahul Garg, Rohit Madhukar Khandekar, Charles Clyde Peck, III, Nils Petter Smeds
   Assignment: IBM

Pending:

2. Title: Deconvolution and Segmentation Based on a Network of Dynamical Units
   Inventors: Guillermo Cecchi, A. Ravishankar Rao, James Kozloski, Charles Peck
   Assignment: IBM
3. Title: Systems, Methods and Computer Products for Controlling Multiple Machines Using a Seamless User-Interface to a Multi-display
   Inventors: Charles Peck, James Kozloski, Cesar Gonzales
   Assignment: IBM
4. Title: Electrochemical Control of Chemical Catalysis Using Single Molecule Motors and Digital Logic
   Inventors: Stanislav Polonsky, Charles Peck, Ajay Royyuru, Daniel Friedman
   Assignment: IBM
5. Title: Neural Network Simulation using Dynamic Action Potential Clamps
   Inventors: David Kaplan, James Kozloski, Charles Peck, John Wagner
   Assignment: IBM

PUBLICATIONS:

Journal Papers:

1. Karin B. Jensen, Guillermo Cecchi, Eva Kosek, Rikard K. Wicksell, Mike Kemani, Diana Kadetoff, Gunnar L. Olsson, Irina Rish, Charles Peck*, Martin Ingvar, "Changing the brain's functional architecture with talk therapy," submitted to *JAMA Psychiatry* (* Shared senior author with Martin Ingvar)
2. A.R.Rao, G.A.Cecchi, C.C.Peck, J.Kozloski., "Unsupervised segmentation with dynamical units," *IEEE Trans. Neural Networks,* Vol 19, No. 1, pp. 168-182, Jan 2008
3. J. Kozloski, K. Sfyrakis, S. Hill, F. Schürmann, C. Peck, H. Markram, "Identifying, Tabulating, and Analyzing Contacts between Branched Neuron Morphologies," *IBM Journal of Research and Development special issue on Massively Parallel Computing,* 52:1/2(43-55), 2008
4. Charles C. Peck and Atam P. Dhawan. "Input Variable Selection for SSME Parameter Modeling using Genetic Algorithms." *IEEE Transactions on Aerospace and Electronic Systems,* January 1996.
5. Charles C. Peck and Atam P. Dhawan. "Genetic Algorithms as Global Random Search Methods: An Alternative Perspective." *Evolutionary Computation,* 3(1):39–80, July 1995.
6. Atam P. Dhawan, Peter J. Disimile, and Charles Peck III. "Three-dimensional temporal reconstruction and analysis of plume images." *Optical Engineering,* 31(11):2366–2373, November 1992.
7. Bruce D. Smith and Charles C. Peck III. "Implementations, comparisons and an investigation of heuristic techniques for cone-beam tomography." *IEEE Transactions on Medical Imaging,* 15(4):519-531, Aug. 1996.

Refereed Conference Papers:

1. Peck, C., & Kozloski, J. (2011). The computational basis of emotions and implications for cognitive architectures. In A. V. Samsonovich, & K. R. Johannsdottir (Eds.), *Proceedings of the Second Annual Meeting of the BICA Society.* (pp. 269–281). IOS Press volume 233 of *Frontiers in Artificial Intelligence and Applications*.
2. A.R.Rao, G.A.Cecchi, C.C.Peck, Kozloski, "Efficient Segmentation in Multi-layer Oscillatory Networks", *Proc. IEEE Intl. Joint Conference on Neural Networks,* pp. 2966-2973, 2008
3. R. Rao, G. A. Cecchi, "Spatio-temporal Dynamics during Perceptual Processing in an Oscillatory Neural Network," Proc. International Conference on Artificial Neural Networks, 2:685-694, 2008
4. J. Kozloski, G.A. Cecchi, C.C. Peck & A.R Rao, "Topographic Infomax in a Neural Multigrid," *Advances in Neural Networks – ISNN 2007,* Aug. 2007, pp 500-509, Springer –Verlag, Berlin,
5. A.R Rao, G.A. Cecchi, C.C. Peck, J. Kozloski, "Emergence of Topographic Cortical Maps in a Parameterless Local Competition Network," *Advances in Neural Networks – ISNN 2007,* Aug. 2007, pp 552-561, Springer –Verlag, Berlin,
6. Charles C. Peck, Tyler Streeter, and James Kozloski, "An Integrated Cerebro-Cerebellar Model Demonstrating Associative Learning and Motor Control," Proceedings of the 2007 Dynamic Brain Forum, Riken Institute and Tamagawa University, Japan, Tamagawa Gakuen, 2007
7. J. Kozloski, G.A. Cecchi, C.C. Peck & A.R. Rao, "A network for computing topographic infomax with and overcomplete basis: Correlates with the neocortical microcircuit," Proceedings of the 2007 Dynamic Brain Forum, Riken Institute and Tamagawa University, Japan, Tamagawa Gakuen, 2007
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10. Y. Liu, G.A. Cecchi, A.R. Rao, J. Kozloski & C.C. Peck, "Inference and Segmentation in Cortical Processing," Proceedings of the 18th Annual Symposium of the International Society of Optical Engineering on Electronic Imaging, San Jose CA, 2006
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13. A. Ravishankar Rao, Guillermo Cecchi, Charles Peck, James Kozloski, "Evaluation of the effect of input stimuli on the quality of orientation maps produced through self organization," *Proceedings of the 14th Scandinavian conference on Image,* pp 810-820, Springer-Verlag, Berlin, Heidelberg, 2005, ISBN:3-540-26320-9 978-3-540-26320-3 doi>10.1007/11499145_82
14. Charles C. Peck, James Kozloski, Guillermo Cecchi, anud A. Ravishankar Rao, "A Biologically Motivated Classifier that Preserves Implicit Relationship Information in Layered Networks," Ribeiro et al, Eds., *Adaptive and Natural Computing Algorithms : Proceedings of the International Conference in Coimbra, Portugal, 2005,* May 2005, Springer-Verlag, Berlin
15. A. Ravishankar Rao, Guillermo Cecchi, Charles Peck, James Kozloski, "A model of the formation of a self-organized cortical representation of color," *2005 SPIE Human Vision and Electronic Imaging Proceedings,* San Jose, January 2005
16. Charles C. Peck, James Kozloski, A. Ravishankar Rao, and Guillermo Cecchi, "Simulation Infrastructure for Modeling Large Scale Neural Systems," Sloot et al, Eds., *Computational Science—International Conference on Computational Science 2003 Proceedings*, Part IV, pages 1127–1136, Melbourne, Australia, June 2003, Springer-Verlag, Berlin
17. Charles C. Peck, Atam P. Dhawan, and Claudia M. Meyer. "Genetic algorithm based input selection for a neural network function approximator with applications to SSME health monitoring." *In Proceedings of the 1993 IEEE International Conference on Neural Networks,* volume II, pages 1115–1122, San Francisco, CA, March 1993. IEEE, IEEE Press.
18. Prashanth Kini, Charles Peck, and Atam P. Dhawan. "Genetic algorithm based reconstruction in diffusion tomography." In Britton Chance, editor, *Photon Migration and Imaging in Random Media and Tissues,* volume 1888. January 1993. SPIE, SPIE.
19. B.D. Smith and C.C. Peck, "Implementation and comparison of a novel computationally efficient cone-beam reconstruction method," SPIE Biomedical Image Processing and Three-Dimensional Microscopy, San Jose, February 1992.
20. Charles C. Peck, Louis K. Arata, and Atam P. Dhawan. "A new interpolation technique for orthogonal sets of tomographic medical images." *In Proceedings of the IEEE International Conference on Systems Engineering,* pages 166–169. Dayton, OH, August 1991, IEEE, IEEE Press.
21. A. P. Dhawan, P. J. Disimile, and C. Peck III. "Four-dimensional reconstruction and analysis of plume images." In *Proceedings of the Fourth International Conference on Laser Anemometry: Advances and Applications,* volume 1, pages 373–385. American Society of Mechanical Engineers, 1991.

Book Chapters:

1. C.C. Peck, J.R. Kozloski, G.A. Cecchi, S.Hill, F.Schuermann, H.Markram, A.R.Rao, "Network Related Challenges and Insights from Neuroscience," in *Bio-Inspired Computing and Communication: First Workshop on Bio-Inspired Design of Networks, BIOWIRE 2007 Cambridge, UK, April 2-5, 2007 Revised Selected Papers,* Lecture Notes in Computer Science, Volume 5151, Springer Berlin/Heidelberg, 2008

Other Conference Papers & Abstracts:

1. J. Kozloski, C.C. Peck, G.A. Cecchi & A.R. Rao, "Layer 2/3 Is A Neural Multigrid: Information Maximization In A Local Network Explains V1 Hypercolumn Formation," COSYNE (Computational and Systems Neuroscience) abstract, 2007.
2. C.C. Peck, T. Streeter, J. Kozloski, "An integrated cerebellum model explaining associative learning, timing prediction, and motor control," Society for Neuroscience Abstracts, 2006.
3. J. Kozloski, C.C. Peck, G.A. Cecchi, A.R. Rao, "A multilevel, multiscale model of cortical map formation and synaptogenesis," Society for Neuroscience Abstracts, 2006.
4. A.R. Rao, G.A. Cecchi, C.C. Peck & J. Kozloski, "Self-organizing cortical maps showing joint frequency and orientation selectivity," Society for Neuroscience Abstracts, 2006, selected for platform presentation (Selection rate: 1 of 8)

5. Charles Peck, Gokhan Caglar, James Kozloski, Ravi Rao, Guillermo Cecchi, "Large-Scale Neocortical Simulation on Blue Gene/L," 2005 Annual Meeting of the Society for Neuroscience, Washington, DC, November 2005
6. James Kozloski, Ravi Rao, Guillermo Cecchi, Charles Peck, "Topographic map formation by maximizing information from naturalistic images in a microcircuit-inspired model of V1," 2005 Annual Meeting of the Society for Neuroscience, Washington, DC, November 2005
7. Guillermo Cecchi, James Kozloski, Charles Peck, Ravi Rao, "Mesoscopic modeling of thalamo-cortical circuitry: large-scale topology, oscillations and synchronization," 2005 Annual Meeting of the Society for Neuroscience, Washington, DC, November 2005
8. James Kozloski, Charles Peck, Ravi Rao, Guillermo Cecchi, "Contour Completion and Figure-Ground Separation using Self-organizing Cortical Maps," 2004 Annual Meeting of the Society for Neuroscience, San Diego, October 2004
9. Charles Peck, James Kozloski, Guillermo Cecchi, Ravi Rao, "A Thalamo-cortical Microcircuit Model Addressing Oscillations and Run Away Excitation," 2004 Annual Meeting of the Society for Neuroscience, San Diego, October 2004
10. Charles Peck, Guillermo Cecchi, Ravi Rao, William Arnold, James Kozloski, "Specification and Simulation of Patterned Microcircuit Connectivity in a Large-Scale Edge Node Simulator," 2002 Annual Meeting of the Society for Neuroscience, Orlando, FL, November 2002
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12. Timothy Doniere, Charles C. Peck, and Atam P. Dhawan. "SSME sensor validation through neural network function approximators." In *Proceedings of the Fifth Annual Space System Health Management Technology Conference*, Cincinnati, OH, April 1993, NASA Space Engineering Center for System Health Management Technology.
13. Charles C. Peck, Atam P. Dhawan, and Claudia M. Meyer. "Selection of input variables for SSME parameter modeling using genetic algorithms and neural networks." *In Proceedings of the Fourth Annual Space System Health Management Technology Conference,* pages 104–118, Cincinnati, OH, November 1992. NASA Space Engineering Center for System Health Management Technology.

Publicly Available Technical Reports:

1. J Kozloski, M Eleftheriou, B Fitch, C Peck, "Interoperable Model Graph Simulator for High-Performance Computing." *IBM Research Reports*, 2009.
2. A.R. Rao, G.A. Cecchi, Kozloski & C.C. Peck, "Unsupervised Segmentation with Dynamical Units," *IBM Technical Report RC23838* (W0512), 2005
3. Charles C. Peck, Atam P. Dhawan. "A review and critique of genetic algorithm theories." *Technical Report TR_153/6/93/ECE,* Department of Electrical and Computer Engineering, University of Cincinnati, Cincinnati, OH, 45221, June 1993.
4. Charles C. Peck, Atam P. Dhawan, and Claudia M. Meyer. "SSME parameter modeling using neural networks and genetic algorithm based input selection." *Technical Report TR_141/1/93/ECE,* Dept. of Electrical and Computer Engineering, University of Cincinnati, Cincinnati, OH, 45221, January 1993.

PRESENTATIONS[2]

Invited, Keynote/Plenary/Featured:

1. The Computational Brain: Can We Extend Objective Understanding to Subjective Experience*?, Brain Awareness Week Grass Lecture*, Carleton University, April 2012
2. Neuroscience and the Future of Computing, Keynote Speech, *CSI 32nd Annual Computer Security Conference & Exhibition*, Washington, DC, November 2005 (www.gocsi.com)
3. Neuroscience and the Future of Computing, Plenary Session: Brain Research and New Technologies, *BioVision 2005*, Lyon, France, April 2005 (www.biovision.org)
4. Applications of Distributed Object Technology to DIS. *The Broad Interest Session of the 12th Workshop on Standards for the Interoperability of Distributed Simulations,* Orlando, FL, March, 1995

Other Invited:

1. Neuroinformatics Research Careers in Industry, *University of Edinburgh,* August 2013
2. A Biologically-Constrained, Computationally Grounded Theory for the Emergence of Subjective Experience, *Workshop on Conscious and Unconscious Mental Functions, International Conference on Neural Networks (ICANN)*, Lausanne, Switzerland, September 2012
3. Understanding brain function, invited lecture for a psychology class, Housatonic Community College, March , 2012
4. Innovation in Neuroscience Research, *Public Policy Forum Leadership Summit on Innovation and the Human Brain*, Toronto, May 2011
5. "The Role of High Performance Computing for Understanding the Brain," HPCS 2010 (Canada's foremost HPC conference), Toronto, ON
6. High Performance Computing for Medical Imaging and Neuroscience Research, *Supercomputing Colloqium Series*, Stony Brook University, October 2008
7. Large-scale Neural System Modeling and Analysis, *Virtual Fly Brain Workshop*, Edinburgh, June 2008
8. Opportunities and Challenges for Improved HRRT PET Reconstruction Quality and Performance using the Blue Gene/L Supercomputer, *SIAM Conference on Mathematics for Industry*, Philadelphia, PA, October 2007
9. HRRT-PET Reconstruction and Correction Opportunities, *Stockholm Brain Institute Annual Retreat at Sandhamn*, August 2007
10. Network-related Challenges and Insights from Neuroscience, *BIOWIRE Workshop*, Cambridge University, UK, April 2007
11. The Blue Brain Project, *ATNS2005 Advanced Technologies in the Neurosciences, Translational Research, Health Policy,* Cambridge, MA, October 2005 (http://www.cimit.org/atns/about.htm)
12. Synchronization and the Binding Problem, *The Royal Institute of Technology (Kungliga Tekniska Högskolan - KTH)*, Stockholm, Sweden, October 2005
13. Large-scale Simulations of Neural Microcircuitry, *École Polytechnique Fédérale de Lausanne (EPFL)*, Lausanne, Switzerland, November 2004
14. A Thalamo-cortical Microcircuit Model Addressing Oscillations and Run Away Excitation, *2004 Annual Meeting of the Society for Neuroscience*, San Diego, October 2004
15. Global Brain Modeling, Neurosciences Institute, San Diego, November 2000
16. Genetic Algorithms as Global Random Search Methods. *The Genetic Algorithm Group,* George Mason University, Fairfax, VA, 1995
17. Analysis of Genetic Algorithms from a Global Random Search Method Perspective with Techniques for Algorithmic Improvement. *Naval Center for Applied Research in Artificial Intelligence*, Naval Research Laboratory, Washington, DC, 1994

Other conference:

[2] Presentations not listed include product & prototype demonstrations, design proposals & reviews, standards proposals, research reviews, customer presentations, capabilities briefings, management reviews & topics, and other informal presentations.

1. Applications of Distributed Object Technology to DIS. *The 11th Workshop on Standards for the Interoperability of Distributed Simulations,* Orlando, FL, September, 1994
2. A new interpolation technique for orthogonal sets of tomographic medical images. *IEEE International Conference on Systems Engineering,* Dayton, OH, August 1991.
3. Selection of input variables for SSME parameter modeling using genetic algorithms and neural networks. T*he Fourth Annual Space System Health Management Technology Conference,* Cincinnati, OH, November 1992.

Conference Posters:

1. Layer 2/3 Is A Neural Multigrid: Information Maximization In A Local Network Explains V1 Hypercolumn Formation, *COSYNE (Computational and Systems Neuroscience)*, 2007
2. An integrated cerebellum model explaining associative learning, timing prediction, and motor control," Society for Neuroscience, Atlanta, 2006
3. Large-Scale Neocortical Simulation on Blue Gene/L, 2005 Annual Meeting of the Society for Neuroscience, Washington, DC, November 2005
4. Topographic map formation by maximizing information from naturalistic images in a microcircuit-inspired model of V1, 2005 Annual Meeting of the Society for Neuroscience, Washington, DC, November 2005
5. Mesoscopic modeling of thalamo-cortical circuitry: large-scale topology, oscillations and synchronization, 2005 Annual Meeting of the Society for Neuroscience, Washington, DC, November 2005
6. Contour Completion and Figure-Ground Separation using Self-organizing Cortical Maps, 2004 Annual Meeting of the Society for Neuroscience, San Diego, October 2004
7. Simulation Infrastructure for Modeling Large Scale Neural Systems, *Computational Science—International Conference on Computational Science 2003*, Melbourne, Australia, June 2003
8. Biometaphorical Computing, 2003 Japan/America Frontiers of Engineering Symposium, NAE, Nara, Japan, 2003
9. Biometaphorical Computing, 2002 Japan/America Frontiers of Engineering Symposium, NAE, Nara, Japan, 2002
10. Specification and Simulation of Patterned Microcircuit Connectivity in a Large-Scale Edge Node Simulator, 2002 Annual Meeting of the Society for Neuroscience, Orlando, FL, November 2002
11. Genetic algorithm based input selection for a neural network function approximator with applications to SSME health monitoring. T*he 1993 IEEE International Conference on Neural Networks,* San Francisco, CA, March 1993.

MEDIA COVERAGE:
Topics and interviews listed below, resulting in greater than 200 articles, internationally, on TV, radio, magazines, newspapers, web, and wire services.

On Biometaphorical Computing:
1. Clint Bolton, Internet News, 3/17/2005
2. Clint Witchalls, freelance (New Scientist, the Economist…), 3/18/2005 & 4/4/2005
3. Mark Hachman, ExtremeTech (PC Magazine), 3/22/2005
4. Michael Kanellos, West Coast Editor-at-Large, CNET, 3/22/2005
5. Laurie Friedman IBM Media Relations for BusinessWeek, 8/15/2005

On artificial intelligence:
6. Aaron Ricadela, Information Week, 4/12/2005

On the ICCS paper on on the LENS simulation infrastructure:
7. Fred Hapgood, Cerebrum, 6/6/2005

On the Blue Brain Project:
8. Clint Witchalls, freelance (New Scientist, the Economist…), 6/1/2005
9. Duncan Graham Rowe, New Scientist, 6/2/2005
10. Jim Giles, Nature, 6/2/2005
11. Keith Regan, E-Commerce Times, 6/2/2005
12. Peter Sayer, IDG, 6/3/2005
13. Sal Salamone, Bio-IT World, 6/3/2005
14. Forbes, 6/3/2005
15. Tim Pricket-Morgan, ComputerWire, 6/3/2005
16. Otis Port, BusinessWeek, 6/3/2005
17. Geoff Watts, BBC Radio, 6/7/2005
18. Antimio Cruz, El Universal of Mexico, 6/10/2005
19. Matthias Matting, German Focus Magazine, 6/13/2005
20. Paola Andrea Guevera, Cambio Magazine, 6/18/2005
21. Frederica Narancio, El Pais (Uruguay), 6/15/2005
22. Dave Talbot, MIT Technology Review, 6/17/2005
23. National Geographic Online, 6/22/2005
24. Mabel Espin Noboa, Diario El Universo, 6/22/2005
25. Susan Kruglinksi, Discover Magazine, 6/23/2005
26. Superinteressante magazine of Brazil, 6/24/2005
27. Mike Huss, Biotech Sweden, 7/31/2005
28. Dana Voth, IEEE Intelligent Systems Magazine, 8/3/2005
29. Randy Atkins, NAE/WTOPS Radio, 8/9/2005
30. Paula Parisi, Hollywood Reporter, 8/9/2005
31. Marcia Franque, El Mercurio de Valparaíso newspaper, 8/29/2005
32. María Paula Ospina P., Semana Magazine, Colombia, 9/7/2005
33. Matt Hamblen, ComputerWorld (Future Watch), 9/20/2005
34. David Kushner, Wired, 9/22/2005
35. María Castillo of Diario Hoy, Ecuadorian Newspaper, 10/24/2005
36. Guillermo Hansen of IBM Agencia de Prensa, Argentina, as intermediary, 11/11/2005
37. Rupert Goodwins, ZDNet UK, 2/28/2006
38. Steve Conway, IDC, 8/16/2006
39. James Netterwald, Genomics and Proteomics Magazine, 10/13/2006
40. Producer, World of Wonder, German TV, 12/20/2006
41. Leoleli Camargo, Rafael Corrêa of Veja Magazine, Brazil, 2/23/2007

On the relationship between nature and technology:
42. Luca Tremolada, Il Sole-24 Ore, 8/8/2005

On the Virtual Fly Brain Workshop:
43. Jasper Hamill, Sunday Herald, 6/8/2008

On brain analysis and modeling:
44. The Prophets of Science Fiction: Mary Shelley episode, on the Discovery Science channel, 11/2011

On high technology firms in Connecticut:
45. Chris Bosak, News-Times, 10/10/2016

CORPORATE COMMUNICATIONS/ADVERTISING:

"What Makes You Special" and "Innovation" Campaigns: Biometaphorical Computing interview resulting in a video webcast used in both campaigns.

TEAM PUBLICATIONS UNDER MY SUPERVISION AND LEADERSHIP:

2013

1. P. Zivic, F. Shifres, G.A. Cecchi, "Perceptual basis of evolving Western musical styles." *Proc. Natl. Acad. Sci. USA*, 2013
2. A.T. Baria, A. Mansour, L. Huang, M.N. Baliki, G.A. Cecchi, M.M. Mesulam, A.V. Apkarian, "Linking human brain local activity fluctuations to structural and functional network architectures," *Neuroimage*,73, 144-155, 2013
3. Irina Rish, Guillermo Cecchi, Benjamin Thyreau, Bertrand Thirion, Marion Plaze, Marie Laure Paillere-Martinot, Catherine Martelli, Jean-Luc Martinot, Jean-Baptiste Poline, "Schizophrenia as a network disease: disruption of emergent brain function in patients with auditory hallucinations." *PloS One* 8(1), e50625, Public Library of Science, 2013
4. H Memelli, B Torben-Nielsen, J Kozloski, "Self-referential forces are sufficient to explain different dendritic morphologies." *Frontiers in Neuroinformatics*, 7(1), Frontiers Media, 2013
5. A. Ravishankar Rao and Guillermo A. Cecchi, "Capacity limits in oscillatory networks: implications for sensory coding." *International Joint Conference on Neural Networks*, IJCNN, IEEE, 2013
6. A. Ravishankar Rao, Guillermo A. Cecchi, "Multisensory integration using sparse spatio-temporal encoding." *International Joint Conference on Neural Networks*, IJCNN, IEEE, 2013
7. Irina Rish and Genady Grabarnik, "Sparse signal recovery with exponential-family noise," book chapter, Compressed Sensing & Sparse Filtering, Springer, 2013
8. Sparse Modeling: Theory, Algorithms, and Applications. Irina Rish and Genady Grabarnik, CRC Press, 1st edition, ISBN-10: 1439828695, to be released Nov, 2013

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9. Machine Learning and Interpretation in Neuroimaging: International Workshop, MLINI 2011, Held at NIPS 2011, Sierra Nevada, Spain, December 16-17, 2011, Revised Selected and Invited Contributions Edited by Georg Langs, Irina Rish, Moritz Grosse-Wentrup, Brian Murphy Springer, 2
10. Guillermo A Cecchi, Lejian Huang, Javeria Ali Hashmi, Marwan Baliki, María V Centeno, Irina Rish, A Vania Apkarian, "Predictive dynamics of human pain perception." *PLoS computational biology* 8(10), e1002719, Public Library of Science, 2012
11. C. Diuk, D. Fernandez Slezak, I. Raskovsky, M. Sigman and G.A. Cecchi, "A quantitative philology of introspection." *Frontiers in Integrative Neuroscience*, 2012
12. J. Honorio, D. Samaras, I. Rish, G.A. Cecchi, "Variable selection for Gaussian graphical models." *Artificial Intelligence and Statistics (AISTATS),* pp. 538-546, MIT Press, 2012
13. I. Rish, G.A. Cecchi, K. Heuton, "Schizophrenia classification using functional network features." *SPIE Medical Imaging,* 2012.
14. I. Rish, G.A. Cecchi, K. Heuton, N.N. Baliki, A.V. Apkarian, "Sparse regression analysis of task-relevant information distribution in the brain." *SPIE Medical Imaging*, 2012.
15. N.B. Mota, N.A.P. Vasconcelos, N. Lemos, A.C. Pieretti, O. Kinouchi, G.A. Cecchi, M. Copelli, S. Ribeiro, "Speech graphs provide a quantitative measure of thought disorder in psychosis." *PLoS One*, 2012.
16. G. Solovey, K.J. Miller, J.G. Ojemann, M.O. Magnasco and G.A. Cecchi, "Self-regulated dynamical criticality in human EcoG." *Frontiers in Integrative Neuroscience,* 6, 44:1-9, 2012
17. A. Ravishankar Rao, Youping Xiao, "A computational model of early visual cortex using koniocellular pathway projections," *International Joint Conference on Neural Networks*, pp. 1-8, IEEE, 2012
18. Soumyabrata Dey, A.Ravishankar Rao, Mubarak Shah, "Exploiting the brain's network structure in identifying ADHD subjects." *Frontiers in Systems Neuroscience*, Frontiers, 2012

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19. D.B. de Araujo, S. Ribeiro, G.A. Cecchi, F.M. Carvalho, T. A. Sanchez, J.P. Pinto, B.S de Martinis, J.A. Crippa, J.E.C. Hallak, A. C. Santos, "Seeing with the eyes shut: neural basis of enhanced imagery following ayahuasca ingestion." *Human Brain Mapping*, Wiley, 2011.

20. A.R. Rao, G.A. Cecchi, "The effects of feedback and lateral connections on perceptual." *International Joint Conference on Neural Networks,* IJCNN , IEEE, 2011.
21. R. Garg, G.A. Cecchi, A.R. Rao, "Brain as a self-predictor: Sparse full-brain auto-regressive modeling in fMRI." *IEEE Symposium on Biomedical Imaging,* ISBI , 2011.
22. A.R. Rao, R. Garg, G.A. Cecchi, "A spatio-temporal support vector machine searchlight for fMRI analysis." *IEEE Symposium on Biomedical Imaging ISBI,* IEEE, 2011.
23. S. Srivastava, A. R. Rao, and V. Sheinin, "Accelerating statistical image reconstruction algorithms for fan-beam x-ray CT using cloud computing." *SPIE Conference on Medical Imaging,* SPIE, 2011.
24. R. Garg, G. A. Cecchi, and A. R. Rao, "Characteristics of voxel prediction power in full-brain Granger causality analysis of fMRI data." *SPIE Conference on Medical Imaging,* SPIE, 2011.
25. J Kozloski, J Wagner, "An Ultrascalable Solution to Large-scale Neural Tissue Simulation." *Frontiers In Neuroinformatics,* Frontiers Media SA, 2011.
26. J Kozloski, "Automated reconstruction of neural tissue and the role of large-scale simulation." *Neuroinformatics,* Springer, 2011.
27. A.R. Rao and G.A. Cecchi, "The effects of feedback and lateral connections on perceptual processing: a study using oscillatory networks." *Proceedings of the International Joint Conference on Neural Networks* (IJCNN) , 2011.
28. The Relevance of the Time Domain to Neural Network Models. A.R. Rao and G.A. Cecchi (Eds.), Springer - Series in Cognitive and Neural Systems, 2011.
29. A.R. Rao, R.Bordawekar, G.A. Cecchi, "Fast computation of functional networks from fMRI activity: a multi-platform comparison." *SPIE Conference on Medical Imaging,* SPIE Press, 2011.
30. R. Garg, G.A. Cecchi, A.R. Rao, "Brain as a self-predictor: Sparse full-brain auto-regressive modeling in fMRI." *Biomedical Imaging: From Nano to Macro,* 2011 IEEE International Symposium .
31. A R Rao, R Garg, G A Cecchi, "A spatio-temporal support vector machine searchlight for fMRI analysis." *Biomedical Imaging: From Nano to Macro,* 2011 IEEE International Symposium .
32. R Garg, G A Cecchi, A R Rao, "Full-brain Auto-Regressive Modeling (FARM) using fMRI." *NeuroImage,* Elsevier, 2011.
33. R Garg, G A Cecchi, A R Rao, "Characteristics of voxel prediction power in full-brain Granger causality analysis of fMRI data." in *Proceedings Medical Imaging: Biomedical Applications in Molecular, Structural, and Functional Imaging,* 2011

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34. K Scheinberg, I Rish, N Bani Asadi, "Sparse Markov net learning with priors on regularization parameters." in *Proceedings of The Eleventh International Symposium on Artificial Intelligence and Mathematics* (ISAIM 2010) .
35. K Scheinberg, I Rish, "Learning sparse Gaussian Markov networks using a greedy coordinate ascent approach." in *Proceedings of European Conference on Macine Learning* (ECML 2010), Barcelona, Spain .
36. R. Bordawekar, U. Bondhugula, A.R. Rao, "Believe it or not!: Multi-core CPUs can match GPU performance for a FLOP-intensive application!" *Parallel Architectures and Compiler Technology,* PACT , 2010.
37. A. R. Rao and G. A. Cecchi, "Investigating the variation of orientation tuning in a computational model of the visual cortex." *International Joint Conference on Neural Networks,* IEEE, 2010.
38. A.R. Rao, G.A. Cecchi, "An objective function utilizing complex sparsity for efficient segmentation." *International Journal on Intelligent Computation and Cybernetics,* 2010.
39. G.A. Cecchi, A. R. Rao, Y. Xiao, and E. Kaplan, "Statistics of natural scenes and cortical color processing." *Journal of Vision,* 2010.
40. D. Fernandez Slezak, C. Suarez, G.A. Cecchi, G. Marshall, G. Stolovitzky, "When the optimal is not the best: parameter estimation in complex biological models." *PLoS ONE,* 2010.
41. I Rish, G A Cecchi, M Baliki, A V Apkarian, "Sparse Regression Models of Pain Perception." in *Proceedings of the International Conference on Brain Informatics* (BI 2010) .
42. M Sigman, P Etchemendy, D F Slezak, G A Cecchi, "Response time distributions in rapid chess: A large-scale decision making experiment." *Frontiers in Decision Neuroscience,* 2010.

43. A R Rao, G A Cecchi, “An objective function utilizing complex sparsity for efficient segmentation in multi-layer oscillatory networks.” *International Journal of Intelligent Computing and Cybernetics,* Emerald Group Publishing Limited, 2010.
44. I Raskovsky, D F Slezak, CG Diuk, GA Cecchi, “The emergence of the modern concept of introspection: a quantitative linguistic analysis.” *Young Investigators Workshop on Computational Approaches to Languages of the Americas,* 2010.
45. J Kozloski, G A Cecchi, “A theory of loop formation and elimination by spike timing-dependent plasticity.” *Frontiers in Neural Circuits,* 2010.
46. A R Rao, G A Cecchi, “Investigating the variation of orientation tuning in a computational model of the visual cortex.” *Neural Networks (IJCNN),* The 2010 International Joint Conference on .
47. Guillermo A. Cecchi, A. Ravishankar Rao, Youping Xiao and Ehud Kaplan, “Statistics of natural scenes and cortical color processing.” *Journal of Vision,* 2010.

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48. A Carmi, I Rish, G Cecchi, D Kanevsky, B Ramabhadran, “Isometry-enforcing data transformations for improving sparse model learning.” *IBM Tech Report RC24801,* 2009.
49. K Scheinberg, I Rish, “SINCO-a greedy coordinate ascent method for sparse inverse covariance selection problem.” *IBM Technical Report,* 2009.
50. N Bani Asadi, I Rish, K Scheinberg, D Kanevsky, B Ramabhadran, “MAP approach to learning sparse Gaussian Markov networks.” in *Proceedings of the International Conference on Acoustics, Speech and Signal Processing* (ICASSP), 2009.
51. I Rish, G Grabarnik, “Sparse signal recovery with exponential-family noise.” in *Proceedings of the Allerton Conference on Communication, Control, and Computing*, 2009.
52. A R Rao, G A Cecchi, High-throughput image reconstruction and analysis. Artech House Publishers, 2009
53. G A Cecchi, I Rish, B Thyreau, B Thirion, M Plaze, ML Paillere-Martinot, C Martelli, JL Martinot, JB Poline, “Discriminative network models of schizophrenia.” *Advances in Neural Information Processing Systems* (NIPS 2009) .
54. S Keates, J Kozloski, P Varker, “Cognitive impairments, HCI and daily living.” *Proceedings of the 5th International Conference on Universal Access in Human-Computer Interaction*, 2009.
55. G Cecchi, R Garg, A Rao, “A cluster overlap measure for comparison of activations in fMRI studies.” *Medical Image Computing and Computer-Assisted Intervention--MICCAI 2009,* Springer.
56. A Rao, G Cecchi, “Self-organizing map simulations confirm similarity of spatial correlation structure in natural images and cortical representations.” *Artificial Neural Networks—ICANN* 2009, Springer.
57. M O Magnasco, O Piro, G A Cecchi, “Self-tuned critical anti-Hebbian networks.” *Physical Review Letters,* APS, 2009.
58. M K Carroll, G A Cecchi, I Rish, R Garg, A R Rao, “Prediction and interpretation of distributed neural activity with sparse models.” *NeuroImage,* Elsevier, 2009.
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