Brain, Computation, and Data Science Activities in 2016

Background: Generous endowment to support three visiting chair positions and research activities

Pratiksha Trust
Kris Gopalakrishnan
Sudha Gopalakrishnan

Objective
High impact collaboration leading to capacity building, and ecosystem Creation in brain, computation, and algorithms, in IISc and India

Core Research Areas
Computational Neuroscience, Data Science, Machine Learning, Neuromorphic Computing and Algorithms

Creating an "Ecosystem" for Neurocomputing and Data Science

CDS

CNS

CSA

ECE

EE

ESE

MATH

MBU

Faculty Members

CHAIR PROFESSORS IN NEUROCOMPUTING AND DATA SCIENCE

Post-Docs, Visitors Ph.D. Students Master's Students

Data Science Machine Learning Algorithms

Computational Neuroscience

Signal Processing Image Analysis

Neuromorphic Computing and Engineering

Neuromorphic Microelectronics

IISc Committee for Chair Positions

K.V.S. Hari

Jayant Haritsa

E. Jemmis

Y. Narahari

G. Rangarajan

P.S. Sastry

Vijayalakshmi Ravindranath

Shri K. Vaidyanathan Distinguished Chair
Professor Shihab Shamma
Professor, Institute of Systems Research, Univ. of Maryland

Education
BS – Imperial College - 1976
MS – Stanford Unv. - 1977
Ph.D. – Stanford University - 1980
Electrical Engineering

Expertise
Speech models of brain;
Neural signal processing;
Computational neuroscience;
Robust control systems;
Neuromorphic engineering.

Awards and Distinction
Fellow, Acoustical Society of USA;
ISR Outstanding Faculty Award;
NIH Advisory Board;
PI of Advanced ERC Grant;
Blaise Pascal Intl. Research Chair

Smt. Sudha Murthy Distinguished Chair
Professor Vasant Honavar, PennState

Education
BE – BMS College, Bangalore, 1982
MS, PhD – Wisconsin, Madison, 1990
Computer Science

Expertise
**AI, Machine Learning,
Bioinformartics,
Computational Neuroscience,
Neuroinformatics**

Current Affiliation
**Director, Center for Big Data Analytics
Director, AI Research Laboratory
Professor of Neuroscience
Professor of Bioinformatics and
Genomics**

Chair Professors in IIT-Madras

Partha Mitra
Cold Spring Harbor Laboratory

Mriganka Sur
Massachusetts Institute of Technology

Anand Raghunathan
Purdue University

Activities (2015-16) (1/4)

June 22, 2015

Launch of Shri K. Vaidyanathan Chair and Appointment of Prof. Shihab Shamma for the Chair

November 9-23, 2015
First Visit of Prof Shihab Shamma
Interactions with Faculty and Students
Participation in the CBR International Meet on Alzheimer's
Nov 19: CSA Distinguished Lecture
(How Neuromorphic computing inspires and learns from cognitive neuroscience and engineering)
(Thanks to Sridharan for hosting the visit)

Activities (2015 - 16)(2/4)

April 27-May 7, 2016
Second Visit of Prof Shihab Shamma
Interactions with Faculty and Students
April 27: Plenary Talk in EECS Research Students Symposium
(Signal processing and brain research)
May 6: Workshop on Cognition: Neurons and Models

April 28-May 6, 2016
Visits by Prof. Maneesh Sahani, UCL and
Prof. Patrick Kanold, UMD
Interactions with Faculty and Students
Tutorial talks in Centre for Neuroscience (CNS)
May 6: Workshop on Cognition: Neurons and Models

Activities (2015 – 16)(3/4)

May 6, 2016

Workshop on Cognition: Neurons and Models

Venue: ECE Golden Jubilee Hall
Number of participants: 110
(Thanks to Sridharan and Sriram for organizing the workshop)

Shihab Shamma
University of Maryland
Cognitive control of auditory perception

Patrick Kanold
University of Maryland
Wiring and plasticity of the Developing auditory cortex

T.V. Sreenivas
Indian Institute of Science
Time varying signal perception and pitch/timbre interaction

Maneesh Sahani
University College London
Perceiving is believing: Bayesian inference in unexpected places

Sriram Ganapathy
Indian institute of Science
Deep learning for speech processing

Activities (2015 – 16)(4/4)

Professor Tom Mitchell, CMU

Visited IISc during December 3-11, 2016
Delivered CBR Lecture on December 6, 2016
Interacted with the BCD team

Outcomes (2015 – 16)

Prof. Shihab Shamma
Has been very active with his involvement and facilitation
Has interacted with faculty members and graduate students

Prof. Maneesh Sahani and Prof. Patrick Kanold
They are extremely keen on continued collaborations.
The May 6th Workshop was a success.

Appointment of Prof. Vasant Honavar
for Smt. Sudha Murthy Chair Position

Visit of Prof. Tom Mitchell (Dec.4-12, 2016) (Thanks to Partha)

Planning of a Workshop during January 9-14, 2017
Details Next page

Informal Group

An Informal Group to create a lively activity in this area

Focus on Algorithms, Brain, Computation, and Data (BCD)

Exploit the involvement of visiting chair professors

Synergy with activities in CNS, CBR

Explore synergy with activities in IITM

Drawing talent from CDS, CNS, CSA, ECE, EE, ESE, MATH, MBU,...

First Meeting on September 23, 2016 (EE)

Kris Gopalakrishnan met with the Group (September 29, 2016)

January 9-14, 2017
Workshop on Neuromorphic Learning and Computing in Brain and Deep Neural Networks

Speakers from IISc, Indian Institutions, and
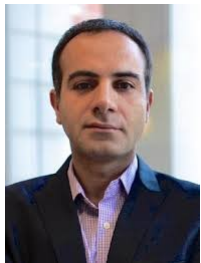
Shihab Shamma
University of Maryland

Patrick Kanold
University of Maryland

Maneesh Sahani
University College London

Stephane Mallat
Ecole Polytechnic

Nima Mesgarani
Columbia University

Christoph Schreiner
UCSF Medical Center

Hynek Hermanski
Johns Hopkins

Vasant Honavar
PennState