Dilawar Singh

Curriculum Vitae

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Info

Born June 5th, 1985 at Nichalpur (India)

Home Nichalpur, Bugwara, Bijnor, U.P. - 246745

Github https://github.com/dilawar Skype dilawar_s

Academic Backgroud

2014-2019 **Ph. D.**, *NCBS Bangalore*
Computational Neuroscience, Thesis Advisor: Prof. Upinder Singh Bhalla

2010-2013 **Ph. D.**, *IIT Bombay*, **withdrawn**
Partition of large scale digital systems, Thesis advisor: Prof. Sachin Patkar <patkar@ee.iitb.ac.in>

2007-2009 **M. Tech.**, *IIT Bombay*, Microelectronics and VLSI
Fabrication of micro-electrode arrays for retinal prosthesis , Thesis advisor: Prof. Dinesh K. Sharma. <dinesh@ee.iitb.ac.in>

2003-2007 **B. Tech.**, *Dr. MGR ERI, Chennai*
Intrumentation and Control Engineering

Work Experience

2013-2014 **Research Fellow**, *NCBS Bangalore*
MOOSE Simulator, PI: Prof. Upinder Bhalla

2009-2010 **Design Engineer**, *Kritical Solutions Noida*
Embedded systems/Firmware development Development of firmware for movie-cameras on DINI board with RTOS Multi. Image stabilization using Kalman filtering. Maintenance of version control system and servers hosted on Solaris OS.

2016-2018 **GSoC Mentor**, *INCF*
For 2016, 17, and 18, I was a mentor in Google Summer of Code (GSoC) program. I mentored for the organization INCF for MOOSE Neural Simulator. These projects involved CUDA/GPU and optimization of solvers.

Research Area

Biological Systems **Robustness, Neural Computation, Memory**
During my Ph.D., I studied mechanisms which can store information for the lifetime of animal. I am very interested in biological systems, especially their robustness and probably approximately correct computation and how these computations can be replicated in artificial systems. Currently I am looking at attention (winner takes all) and habituation (ignoring non-changing component of environment) in biological systems and neural mechanisms which gives rise to them.

Projects

NCBS Hippo — **Content management system and community app**

https://ncbs.res.in/hippo is a RESTful website written in PHP7+Codeigniter. It automatically schedules students' annual progress seminars using network flow methods (Python+networkx). It also manages venue booking, and various talks happening on the campus. Repository: `https://github.com/dilawar/Hippo`. I also wrote an accompanying social Android App using `cordova+Vue+Framework7`. It is available at Google Play.

MOOSE simulator — **Multiscale Object Oriented Simulation Engine**

During my Ph.D. at NCBS Bangalore, I worked on MOOSE simulator. Specially I created CMake based build, CI integration, packaging for PyPI and various linux distribution. I also integrated BOOST based ODE solvers to improve the efficiency of solvers. I also handle various maintenance related tasks. Repository: `https://github.com/BhallaLab/moose-core`

Arduino/PI based behavioural setup — **Animal Behaviour Box**

An automated behavioural pipeline using Arduino Uno, Point Grey's high speed cameras etc. Repository: `https://github.com/BhallaLab/AnimalBehaviour`.

Other projects

My other public projects can be found on `https://github.com/dilawar/`. Among these, `CodeSniffer` which checks plagiarism in student's coding assignments; a parser of WAV file; eye blink detection (opencv); a tool to extract data from old figures are more popular on github.

Skills

Languages	C/C++, Python, Haskell, Javascript, VHDL/Verilog/Bluespec, SQL, PHP, Lua, LaTeX
CAD Tools	KiCAD, Cadence, Xilinx and Altera tools, Ngspice
Frameworks	HTML+Vue.js, PHP+Codeigniter, Python+Scipy/Pandas/Matplotlib, pandoc ec.
Software Development	CMake/Android Studio, Travis CI/Jenkins/GITLAB CI , Various RPM/DEB on Open Build Service, Some projects on PyPI

Publications

2019 Dilawar Singh. "Switches in the Brain?" In: *RESONANCE* 24.9. 00000, p. 963.

2018 Dilawar Singh and Upinder Singh Bhalla. "Subunit Exchange Enhances Information Retention by CaMKII in Dendritic Spines". In: *eLife* 7. Ed. by Leslie C Griffith and Gary L Westbrook. `https://doi.org/10.7554/eLife.41412`, e41412. ISSN: 2050-084X. DOI: `10.7554/eLife.41412`.

2013 Prateek Saxena et al. "Hardware-Software Scalable Architectures for Gaussian Elimination over GF (2) and Higher Galois Fields." In: *PECCS*. 00000, pp. 195–201.

2012 Dilawar Singh. "Self-Reliance of Indian Intellectuals". In: *Economic and Political Weekly* 47.39. 00000, pp. 1–2.