

# Varun Aggarwal

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## EDUCATION

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### Massachusetts Institute of Technology, Cambridge, MA

Candidate for PhD, Electrical Engineering and Computer Science Dep't.

Coursework Included: Machine Learning, Computational Functional Genomics, Design of Analog MOS LSI

Current GPA: 5.0/5.0

### Netaji Subhas Institute of Technology (Former DIT), Univ. of Delhi, India, 2000-2004

Bachelors of Engineering, Electronics and Communication, Percentage: 82.54%

## WORK EXPERIENCE

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### Research Assistant, Humanoid Robotics Group, CSAIL, MIT (since Sept 2005)

- Advised by Dr. Una-May O'Reilly, Principal Research Scientist, CSAIL, MIT
- Research Focus: Large Scale Modeling and Optimization, Analog Circuit Optimization

### Associate Design Engineer, ST Microelectronics, June 2004-June 2005

- Design and Characterization of digital standard cell libraries for NVM technology.
- Industry-university Interaction for Research Project.

### Summer Project Student, Stockholm Bioinformatic Center, Sweden, June-July 2003

- Protein secondary structure prediction using unsupervised learning and genetic programming techniques.

## TECHNICAL SKILLS

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- Evolutionary Algorithms and Machine Learning
- Analog Design, Automation and Optimization
- Digital Standard Cell Library design and characterization
- Embedded System Design

### Tools

OPUS, Eldo/PSPICE/HSPICE, Orcad, Xilinx ISE, ModelSim XE

### Languages

MATLAB, Perl, VHDL, C++, Unix Shell Programming, Assembly (8085/AVR/8051)

## SELECTED PUBLICATIONS

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V. Aggarwal, U.-M. O'Reilly, "**Design of Posynomial Models for Mosfets: Symbolic Regression Using Genetic Algorithms**", to appear as a chapter in Genetic Programming: Theory and Practice IV, 2006.

T. Ohlson, V. Aggarwal, A. Elofsson, R. M. MacCallum, "**Improved alignment quality by combining evolutionary information, predicted secondary structure and self-organizing maps**", BMC Bioinformatics, 7:357, 2006

V. Aggarwal, W. O. Jin, U. M. O'Reilly, "**Filter Approximation Using Explicit Time and Frequency Domain Specifications**", Proceedings of the 8th Annual Conference on Genetic and evolutionary computation (GECCO 2006), pages 753-760, July 2006 (**Nominated for Best Paper Award**)

V. Aggarwal, "**Evolving Sinusoidal Oscillators Using Genetic Algorithms**", in Proc., The 2003 NASA/DoD Conference on Evolvable Hardware, Chicago, USA, July 2003, pp. 67-76

V. Aggarwal, "**Power Saving Pedometer also measures speed**", in Electronic Design (Penton, USA), 07.19.04, pp. 63-64

## AWARDS / EXTRACURRICULAR

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Awarded Gold in HUMIES: Human Competitive Awards at GECCO 2006, Seattle, USA

Reviewer for IEEE Trans. On Evolutionary Computation, Digital Signal Processing (Kluwer), European Conference on Genetic Programming, etc.

Received 1<sup>st</sup> Prize in Computer Society of India Young IT Professional Award (Region North, 2003)

Co-founder for Coalition to Uproot Ragging in Education. ([www.noragging.com](http://www.noragging.com))

## ALL PUBLICATIONS

### Journal Articles/Book Chapters

V. Aggarwal, U-M O'Reilly, "Design of Posynomial Models for Mosfets: Symbolic Regression Using Genetic Algorithms", to appear as chapter in Genetic Programming: Theory and Practice IV, 2006.

T. Ohlson, V. Aggarwal, A. Elofsson, R. M. MacCallum, "Improved alignment quality by combining evolutionary information, predicted secondary structure and self-organizing maps", BMC Bioinformatics 2006, 7:357

V. Aggarwal, S. Kilinc, U. Cam, "Minimum component SRCO and VFO using a single DVCCC", Accepted in Analog Integrated Circuits and Signal Processing, 2006

S. Kilinc, V. Jain, V. Aggarwal, U. Cam, "Catalogue of Variable Frequency and Single-Resistance-Controlled Oscillators Employing A Single Differential Difference Complementary Current Conveyor", Accepted in Frequenz: Journal of RF Engineering and Telecommunications, 2006

V. Aggarwal, "Novel Canonic Current Mode DDCC based SRCO synthesized using Genetic Algorithms", in Analog Integrated Circuits and Signal Processing, Vol: 40, 83–85, 2004

### Conference Papers

M. Kim, M. Médard, V. Aggarwal, U. M. O'Reilly, W. Kim, C. W. Ahn, M. Effros, "Evolutionary Approaches to Minimizing Network Coding Resources," submitted to IEEE INFOCOM 2007.

V. Aggarwal, M. Mao, U. M. O'Reilly, "A Self-Tuning Analog Proportional-Integral-Derivative (PID) Controller", 1st NASA/ESA Conference on Adaptive Hardware and Systems, pages 12-19, 2006

V. Aggarwal, W. O. Jin, U. M. O'Reilly, "Filter Approximation Using Explicit Time and Frequency Domain Specifications", Proc. 8th annual conference on Genetic and evolutionary computation (GECCO 2006), pages 753-760, 2006 (*Nominated for Best Paper Award*)

M. Terry, J. Marcus, M. Farrell, V. Aggarwal, U M O'Reilly, "GRACE: Generative Robust Analog Circuit Exploration", 9th European Conference on Genetic Programming, EuroGP 2006, Lecture Notes in Computer Science, Volume 3907, 2006, Pages 332 - 343

V. Aggarwal and R. M. MacCallum, "Evolved Matrix Operations for Post-Processing Protein Secondary Structure Predictions", in Proc., 7th European Conference on Genetic Programming, EuroGP 2004, Vol: 3003, LNCS, pages 220-229, 2004

V. Aggarwal, "Evolving Sinusoidal Oscillators Using Genetic Algorithms", in Proc., The 2003 NASA/DoD Conference on Evolvable Hardware, Chicago, USA, pp. 67-76, 2003.

### Magazine Articles

V. Aggarwal, "Jagadish Chandra Bose: The Real Inventor of Marconi's Wireless Detector", The Ancient Wireless Association Journal, Vol. 47/#3, pages, 50-54, 2006

V. Aggarwal, "Power Saving Pedometer also measures speed", in Electronic Design (Penton, USA), 07.19.04, pp. 63-64, (Online Link: <http://www.elecdesign.com/Articles/ArticleID/8363/8363.html> )