Curriculum Vitae

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Siddharth Narayanaswamy

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School of Electrical and Computer Engineering
Purdue University
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465 Northwestern Avenue
West Lafayette, IN 47907, USA
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Skills

extensive experience with algorithms, computer-vision, signals and systems, robotics, machine learning, statistics, visual perception, cognitive science, linguistice, knowledge representation, compiler design, haptics, automatic-differentiation, stochastic and non-deterministic programming languages, functional programming, logic and constraint programming, parallel programming, contributions to open-source projects

Languages
Scheme, Haskell, Lisp, Python, C/C++, MATLAB, Prolog, Java, VHDL, Verilog, DSP(AD Blackfin) assembly, microcontroller assembly, x86 assembly

native English, Tamil, and Hindi

Education

PhD - Artificial Intelligence *Aug. 2008 – expected Jan. 2014*
Purdue University, USA

Thesis Title: Compositionality in Vision and Language
Advisor: Jeffrey Mark Siskind

grounding language in vision and robotics
stochastic modeling of compositional entities via probabilistic programming
nondeterministic programming for solving constraint-satisfaction problems
optimization of stochastic cognitive models
integration of language and activity recognition
segmentation and tracking of objects in videos with high-level semantic priors
neural representation of verbs, events, and compositionality

Artificial Intelligence, Computer Vision, Natural Language Processing
Machine Learning, Robotics, Cognitive Neuroscience

Bachelor of Engineering - Electronics and Communication *Aug. 2004 – Aug. 2008*
Anna University, India

Image Processing, Speech Processing, Computer Vision
Communication Systems, Embedded Systems (Robotics)

Experience

PhD student, Artificial Intelligence *2008 – present*
Advisor: Jeffrey Mark Siskind
Purdue University, USA

solved vision and robotic manipulation problems using AD-based optimization
developed and implemented stochastic programs to use language & vision, and reasoning about rules jointly, to solve for perception
developed novel and robust tracking, segmentation, and action recognition methods as part of the DARPA Mind's Eye program
processed millions of frames of video on a top-500 supercomputer
designed and evaluated human-subject experiments on event recognition using fMRI data collection and analysis tools
designed and built custom robots for general manipulation tasks
implemented closed-loop visual-servoing mechanism to drive motor control
TA for ECE473 & ECE570, Artificial Intelligence
http://iffsid.com/research/

Undergraduate Research Project *May 2007 – Aug. 2008*
Guided by Professor Muniyandi Manivannan IIT-Madras, India

implemented a DIY Part-Task Laparoscopic Simulator
optimized vision algorithms to run on low-cost uncalibrated components
tested against industry-standard equipment demonstrating low error margins
collaborated with practicing doctors to test feasibility

Part-Time Instructor *Oct. 2007 – Aug. 2008*
The Princeton Review(Manya Education Pvt.Ltd.) Chennai, India

tutor for the GRE and GMAT standardized exams

Undergraduate Research Intern *May 2007 – Sept. 2007*
Doors and Gates Pvt.Ltd. Chennai, India

implemented a range of IR control mechanisms for controller operations
tested and used implemented mechanisms successfully in robots during competitions
designed hybrid autonomous switching mechanisms for non-line-of-sight applications

Refereed Journal Publications

Seeing Unseeability to See the Unseeable *Oct 2012*
J1 N. Siddharth, A. Barbu, and J. M. Siskind
Advances in Cognitive Systems (ACS)
http://iffsid.com/publications/siddharth2012unseeability.pdf

Simultaneous Object Detection, Tracking, and Event Recognition *Oct 2012*
J2 A. Barbu, N. Siddharth, A. Michaux, and J. M. Siskind
Advances in Cognitive Systems (ACS)
http://iffsid.com/publications/barbu2012objectsTackingEvents.pdf

Refereed Conference Publications

Seeing what you're told: sentence-guided activity recognition in video *In review*
C1 N. Siddharth, A. Barbu, and J. M. Siskind
Neural Information Processing Systems (NIPS)

The compositional nature of verb and argument representations in the human brain *In review*
C2 A. Barbu, N. Siddharth, C. Xiong, J. J. Corso, C. D. Fellbaum, C. Hanson, S. J. Hanson, S. Hélie, E. Malaia, B. A. Pearlmutter, J. M. Siskind, T. M. Talavage, and R. B. Wilbur
Neural Information Processing Systems (NIPS)
http://arxiv.org/pdf/1306.2293v1

Saying what you're looking for: linguistics meets video search *In review*
C3 A. Barbu, N. Siddharth, and J. M. Siskind
Neural Information Processing Systems (NIPS)

Recognizing Human Activities from Partially Observed Videos *Jun 2013*
C4 Y. Cao, D. Barrett, A. Barbu, N. Siddharth, H. Yu, A. Michaux, Y. Lin, S. Dickinson, J. Siskind, S. Wang
IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
http://iffsid.com/publications/cao2013partiallyObserved.pdf

Seeing Unseeability to See the Unseeable *Oct 2012*
N. Siddharth, A. Barbu, and J. M. Siskind
C5 *Advances in Cognitive Systems (ACS)*
oral 14/38 (37%), conference presentation associated with [J1]
http://iffsid.com/publications/siddharth2012unseeability.pdf

Simultaneous Object Detection, Tracking, and Event Recognition *Oct 2012*
A. Barbu, N. Siddharth, A. Michaux, and J. M. Siskind
C6 *Advances in Cognitive Systems (ACS)*
oral 14/38 (37%), conference presentation associated with [J2]
http://iffsid.com/publications/barbu2012objectsTackingEvents.pdf

Video In Sentences Out *Aug 2012*
A. Barbu, A. Bridge, Z. Burchill, D. Coroian and S. Dickinson , S. Fidler, A. Michaux, S. Mussman and N. Siddharth , D. Salvi, L. Schmidt, J. Shangguan and J. M. Siskind, J.
C7 Waggoner, S. Wang, J. Wei and Y. Yin and Z. Zhang
Proceedings of the Twenty-Eighth Conf. on Uncertainity in Artificial Intelligence(UAI)
oral 24/304 (8%)
http://iffsid.com/publications/barbu2012videoSentences.pdf

A Visual Language Model for Estimating Object Pose and Structure in a Generative Visual Domain *May 2011*
N. Siddharth, A. Barbu, and J. M. Siskind
C8 *Proceedings of 2011 IEEE International Conf. on Robotics and Automation(ICRA)*
oral 982/2004 (49%)
http://iffsid.com/publications/siddharth2011VisualLanguage.pdf

Learning Physically-Instantiated Game Play Through Visual Observation *May 2010*
A. Barbu, N Siddharth, and J. M. Siskind
C9 *Proceedings of 2010 IEEE International Conf. on Robotics and Automation(ICRA)*
oral 856/2062 (42%)
http://iffsid.com/publications/barbu2010RobotGames.pdf

Design of a Do-It-Yourself VR Based Laparoscopic Simulator *Jan. 2009*
C10 N. Siddharth, M. Manivannan, S. Devasahayam, and G. Mathew
Medicine Meets Virtual Reality (MMVR17)

Patent Applications

Sentential Video Search *Jun. 2013*
P1 A. Barbu, N. Siddharth, H. Yu, and J. M. Sikind
US Provisional Application 61/835,541

Technical Reports

Large-scale automatic labeling of video events with verbs based on event-participant interaction *Apr. 2012*
T1 A. Barbu, N. Siddharth, H. Yu, and J. M. Sikind
arXiv:1204.3616
http://arxiv.org/abs/1204.3616

Professional Society Membership

Member, IEEE

Referee Activity

AAAI NIPS CVPR PAMI ICDL PRL

References

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