

Arpan Chakraborty

PhD Candidate
Department of Computer Science
North Carolina State University

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Research Interests

Primary focus on computational modeling of vision. Interested in full-time positions in applied areas including intelligent user interfaces, data analytics, mobile applications and augmented reality.

Education

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| 2008–current | North Carolina State University, Raleigh, NC
PhD in Computer Science .. To be conferred: Aug 2014 (defended: April 2014), GPA: 4.0 <ul style="list-style-type: none">• Advisor: Dr. Robert St. Amant• Dissertation: A biologically inspired active vision framework for cognitive agents
Early visual processing in a hierarchical neuronal architecture (C++, Python, OpenCV); salient object detection; visual memory model; interface with higher-level systems MS in Computer Science Graduated: May 2010, GPA: 4.0 |
| 2004–2008 | West Bengal University of Technology, Kolkata, India
BTech in Computer Science Graduated: Aug 2008, GPA: 8.43/10 |

Research

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| 2008–current | North Carolina State University, Raleigh, NC <ul style="list-style-type: none">• Low-level analytics models of cognition (Science of Security Lablet) RA, current Behavioral study design; game development (Flash); data collection (AmfPHP, MySQL); mouse movement pattern analysis (R, Python); cognitive modeling (ACT-R)• Tangible data exploration with augmented reality Pilot project
End-to-end AR system prototype with novel tracking mechanism (Python, OpenCV, OpenGL); custom physical tools designed and fabricated on a 3D printer (Blender); interface with commercial 6-DoF haptic pointing device (C++, ZMQ)• A mobile aid for users with disabilities RA, 2010
Computer vision-based mobile application that detects objects in user's peripersonal space (Java, Android API, JNI, C++, OpenCV); custom guidance hardware – a wireless glove with haptic vibrators (Arduino, Bluetooth radio)• An embodied approach towards identifying spatial regions PhD qualifier, 2009
Visual analysis agent for finding navigable spaces developed on the Sony Aibo robot platform (C++, Tekkotsu framework) |
| 2007–2008 | Indian Statistical Institute, Kolkata, India <ul style="list-style-type: none">• Fuzzyfied default logic – a hybrid formalism to use default rules in a fuzzy domain
Challenges in knowledge representation addressed by combining two logical formalisms |

Teaching

2008–current	North Carolina State University, Raleigh, NC <ul style="list-style-type: none">• Instructor: Automata, Grammars and Computability Summer 2012• Guest Lecture: Human Computer Interaction 2012• TA: Data Structures, Automata, Algorithms, Applied Logic, HCI 2008–2011
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Employment

2011–2012	Office of International Services, NCSU, Raleigh, NC Student information website (Adobe ColdFusion, HTML5, jQuery); database design (MS-SQL, UML); payment gateway integration (PayPal)
2010	TouchCentric, Raleigh, NC Back-end web services for iPhone app “Mobile Health Library” (PHP); database design (MySQL); generic smartphone UI development (XML/XSL)
2006–2007	Greenfield Solutions, Kolkata, India Software estimation and project management tool – requirements analysis; documentation (team lead); system design (Visio, UML); web application development (ASP.NET)

Summary of Skills

Languages	Python, C, C++, Java, R, Lisp
Libraries	OpenCV, OpenGL, ROS, Tesseract OCR
Platforms	Android, .NET, Embedded Systems
Web	Javascript, AJAX, PHP, ColdFusion, JSP, ASP
Tools	Blender, Flash

Activities and Honors

2013	Awarded AAAI Student Scholarship to attend AAAI 2013 Fall Symposium Series in Arlington, VA
2012–current	Institute of Electrical and Electronics Engineers (IEEE) – Graduate Student Member <ul style="list-style-type: none">• Active member of NCSU IEEE Robotics Team• Participated in IEEE SoutheastCon 2013 Hardware Competition
2010–2013	Co-edited a book <i>Practical Graph Mining with R</i> – published July, 2013
2012	Association for Computing Machinery (ACM) SIGCSE 2012 – Student Volunteer
2009–2012	STARS Alliance, NCSU Chapter – Member <ul style="list-style-type: none">• Leader, NCSU Student Leadership Corps (SLC) 2011–2012• Hosted annual “STARS Celebration” conference in Raleigh, NC 2011• Evaluated impact of STARS on recruitment & retention 2009–2011
2011	Graduate student application review for NCSU Computer Science program
2010	The Honor Society of Phi Kappa Phi – Member <ul style="list-style-type: none">• Awarded membership invitation for academic excellence

Publications

- 2014 Chakraborty, A., Harrison, B., Yang, P., Roberts, D., and St. Amant, R. (2014b). Exploring key-level analytics for computational modeling of typing behavior (poster). In *Proceedings of the 2014 Symposium and Bootcamp on the Science of Security (HotSoS)*, Raleigh, NC, USA. ACM
- Chakraborty, A., Gross, R., McIntee, S., Hong, K. W., Lee, J. Y., and St. Amant, R. (2014a). CAPTIVE: A cube with augmented physical tools. In *CHI '14 Extended Abstracts on Human Factors in Computing Systems*, New York, NY, USA. ACM
- 2013 Chakraborty, A. and St. Amant, R. (2013). Towards a neurocognitive model of visual perception. In *Proceedings of the 2013 AAAI Fall Symposium Series*. AAAI Press
- Barik, T., Chakraborty, A., Harrison, B., Roberts, D., and St. Amant, R. (2013). Speed/Accuracy Tradeoff in ACT-R Models of the Concentration Game. In West, R. and Stewart, T., editors, *Proceedings of the 12th International Conference on Cognitive Modeling*, pages 292–297, Ottawa. Carleton University
- Chakraborty, A., Wilson, K., Green, N., Alur, S. K., Ergin, F., Gurumurthy, K., Manzano, R., and Chinta, D. (2013). Link Analysis. In Samatova, N. F., Hendrix, W., Padmanabhan, K., Jenkins, J., and Chakraborty, A., editors, *Practical Graph Mining with R*, volume 32, page 75. CRC Press
- Bahram, S., Chakraborty, A., Ravindran, S., and St. Amant, R. (2013). Intelligent Interaction in Accessible Applications. In Biswas, P., Duarte, C., Langdon, P., Almeida, L., and Jung, C., editors, *A Multimodal End-2-End Approach to Accessible Computing*, pages 93–117. Springer, London
- 2012 Horton, T. E., Chakraborty, A., and St. Amant, R. (2012). Affordances for robots: a brief survey. *AVANT – Journal of the Philosophical-Interdisciplinary Vanguard*, 3(2):70–84
- Bahram, S., Chakraborty, A., and St. Amant, R. (2012). CAVIAR: A vibrotactile device for accessible reaching. In *Proceedings of the 2012 ACM international conference on Intelligent User Interfaces*, pages 245–248, New York. ACM
- Zhao, Y., Chakraborty, A., Hong, K. W., Kakaraddi, S., and St. Amant, R. (2012). Pointing at responsive objects outdoors. In *Proceedings of the 2012 ACM international conference on Intelligent User Interfaces*, pages 281–284, New York. ACM
- 2011 Ray, K. S. and Chakraborty, A. (2011). A fuzzy version of default logic. *International Journal of Intelligent Computing and Cybernetics*, 4(1):5–24

Talks and Workshops

- 2014 Invited seminar: *Towards a neurocognitive model of visual perception*, Research Seminar organized by Computer Science Graduate Student Association, NCSU, Raleigh, NC.
- 2013 Invited talk: *3D Printing for Learning and Research*, SAS 3D Printing Unconference, SAS Institute Inc., Cary, NC.
- 2013 Talk: *Modeling Human Behavior from Low-Level Input Analytics*, Science of Security Lablet Industry Meet, NCSU, Raleigh, NC
- 2012 Workshop: *Introduction to Android Programming*, NCSU, Raleigh, NC
- 2011 Invited seminar: *A biologically inspired active vision framework for cognitive agents*, Indian Statistical Institute, Kolkata, India

Updated April 29, 2014