Swami Iyer

Contact Information

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Academic Interests

Evolutionary dynamics on complex networks, machine learning, pedagogy

Education

PhD, Computer Science, University of Massachusetts at Boston, 2013

MS, Computer Science, University of Massachusetts at Boston, 2001

BE, Electronics and Telecommunication, University of Mumbai, 1996

Teaching Experience

Mathematics Department, University of Massachusetts at Boston

- Calculus I (Math 140)
- Calculus I for Life and Environmental Sciences (Math 145)
- Calculus II for Life and Environmental Sciences (Math 146)
- Introduction to Mathematical Biology (Math 303) — assisted the instructor with the programming sessions

Computer Science Department, University of Massachusetts at Boston

- Compilers (CS451/651)
- Intermediate Computing with Data Structures (CS210)
- Introduction to Computing (CS110)
- Introduction to Java Part II (CS115L)
- igniteCS Python Workshop

Work Experience

Senior Lecturer, Computer Science Department, University of Massachusetts at Boston; Sep 2014 –

- Teach three courses: Introduction to Computing (CS110), Intermediate Computing with Data Structures (CS210), and Compilers (CS451/651)

- Serve on various department- and college-level committees
- Conduct research in the areas of evolutionary dynamics on complex networks and machine learning

Lecturer, Computer Science Department, University of Massachusetts at Boston; Sep 2014 – Aug 2021

- Taught three courses: Introduction to Computing (CS110), Intermediate Computing with Data Structures (CS210), and Compilers (CS451/651)
- Served on various department- and college-level committees
- Conducted research in the areas of evolutionary dynamics on complex networks and machine learning

Postdoctoral fellow, Physics and Mathematics Departments, University of Massachusetts at Boston; Sep 2013 – Aug 2014

- Worked on computational modeling of the post-transcriptional regulation of PTEN, one of the most commonly lost tumor suppressors in human cancers
- Taught Calculus 1 (Math 140) and Calculus I and II for Life and Environmental Sciences (Math 145 and Math 146)

Software developer, BMC Software, Waltham, MA; Jun 2001 – May 2006

- Designed and developed system- and application-level performance-monitoring software

Software developer, Tata Interactive Systems, Bombay, India; Apr 1997 – Aug 1998

- Designed and developed multimedia-rich e-learning software

Publications

Books

- Bill Campbell, Swami Iyer, and Bahar Akbal-Delibaş. *An Introduction to Compiler Construction in a Java World*. CRC Press (2012).

Papers

- Swami Iyer and Timothy Killingback. *Evolution of Cooperation in Social Dilemmas with Assortative Interactions*. Submitted to the Journal of Theoretical Biology.
- Swami Iyer and Timothy Killingback. *Evolution of Cooperation in Social Dilemmas on Complex Networks*. PLoS Computational Biology 12(2), e1004779 (2016).
- Swami Iyer and Timothy Killingback. *Evolutionary Dynamics of a Smoothed War of Attrition Game*. Journal of Theoretical Biology 396, 25 – 41 (2016).
- Stefanie Gazda, Swami Iyer, Timothy Killingback, Richard Connor, and Solange Brault. *Network-based Analysis of Activity Patterns in Bottlenose Dolphins (Tursiops Truncatus) in Cedar Key, Florida*. Royal Society Open Science 2(3), 140263 (2015).
- Swami Iyer and Timothy Killingback. *Evolutionary Dynamics of the Traveler's Dilemma and Minimum Effort Coordination Games on Complex Networks*. Physical Review E 90(4), 042134 (2014).
- Swami Iyer, Joshua Reyes, and Timothy Killingback. *An Application of Evolutionary Game Theory to Social Dilemmas: The Traveler's Dilemma and the Minimum Effort Coordination Game*. PLoS ONE 9(4), e93988 (2014).
- Swami Iyer, Timothy Killingback, Bala Sundaram, and Zhen Wang. *Attack Robustness and Centrality of Complex Networks*. PLoS ONE 8(4), e59613 (2013).
- Swami Iyer and Dan Simovici. *Structural Classification of XML Documents Using Multisets*. International Journal on Artificial Intelligence Tools 17(5), 1003 – 1022 (2008).
- Swami Iyer and Dan Simovici. *Multisets and Clustering XML Documents*. Proceedings of the 19th International Conference on Tools with Artificial Intelligence, Patras, Greece (2007).

Poster Presentations

- Fateme Pourhasanzade, Swami Iyer, Jesslyn Tjendra, and Selina Våge. *Individual-based model highlights the importance of trade-offs in shaping bacteria-phage co-evolutionary dynamics*. Poster presentation at the ASLO Aquatic Sciences Virtual Meeting (2021).

- Rachel Fiolek, Swami Iyer, and Timothy Killingback. *Complex Network Topologies Resilient to Centrality Attack*. Poster presentation at the 22nd Annual Massachusetts Statewide Undergraduate Research Conference, University of Massachusetts at Amherst (2016).

- Swami Iyer, Robert Moray, Prajna Kulkarni, Rahul Kulkarni, and Kourosh Zarringhalam. *A Machine Learning Approach for Identifying the PTEN Non-coding ceRNA Network*. Poster presentation at the Winter q-bio Meeting, Waikoloa, Hawaii (2014).

- Stefanie Gazda, Swami Iyer, Timothy Killingback, Richard Connor, and Solange Brault. *Network Analysis by Activity Reveals Community Overlap and Differences in Centrality of Individuals in Bottlenose Dolphins (Tursiops Truncatus) in Cedar Key, Florida*. Poster presentation at the 19th Biennial Conference of the Biology of Marine Mammals, Tampa, Florida (2011).

- Christina Ciarfella, Stefanie Gazda, Swami Iyer, Solange Brault, and Timothy Killingback. *Residency Patterns and Social Structure of Bottlenose Dolphins*. Poster presentation at the University of Massachusetts at Boston (2010).

PhD Thesis

- Swami Iyer. *Evolutionary Dynamics on Complex Networks*. University of Massachusetts at Boston (2013). Advisor: Prof. Timothy Killingback.

Awards

Hjort Scholar Award, Hjort Centre for Marine Ecosystem, Bergen, Norway, 2017

Joseph P. Healey Research Grant (Jul 1, 2015-Jun 30, 2016); Role: Co-PI (PI: Timothy Killingback); Grant Title: Evolution of Disease Virulence on Contact Networks; Funds: $12,000

Student Leadership Award, University of Massachusetts at Boston, 2007

Outstanding Achievement in Computer Science Award, University of Massachusetts at Boston, 2013

Mentoring

Graduate Students

- Alexander Zhurkevich. *EFS: An Efficient, Fast and Scalable Semantic Segmentation Pipeline Using TensorFlow 2*. Fall 2021.
- Jason Held. *A Neural Network Model for Classifying Bubble-based Instructor Evaluations, and an Accompanying Web Portal*. Fall 2017 – Spring 2018.
- Jeff Amari, Jason Curran, Divyansh Dhakre, Kinjalk Parmar, Nikhil Sidhwani, and Tory Wheelwright. *Web-based Visualizations of Algorithms*. Fall 2016 – Spring 2017.
- Timothy Cronin, Pragna Gopal, Joelle Skaff, and Keith Wright. *Visual MMIX*. Fall 2007 – Spring 2008.
- Saaid Baraty, Dhriti Dave, Glenn Hoffman, and Madhavi Tolety. *Visual Parser*. Fall 2002 – Spring 2003.

Undergraduate Students

- Roy Varon Weinryb. *Detecting Audio with AI*. Summer 2021.
- Joyce Quach. *Implementation of Algorithms from Introduction to Compiler Construction in a Java World*. Spring 2021.
- Rachel Fiolek. *Complex Network Topologies Resilient to Centrality Attack*. Fall 2015 – Spring 2016.
- Paola Leon Alarcon. *Effect of Vaccination on Epidemic Spread on Complex Networks*. Fall 2015 – Spring 2016.
- Kai Ching Lam, Vy Thao Nguyen, Vy Thuy Nguyen, and Matthew H. Santaguida. *Tokanagrammar - A Jigsaw Puzzle for Nerds*. Spring 2013.

Service

Computer Science Department, University of Massachusetts at Boston

- Curriculum Committee, Fall 2015 –
- Student Recruitment and Retention Committee, Fall 2015 –
- Publicity and Outreach Committee, Fall 2016 –
- Ad-hoc committee to redesign the Apply System (sign-up software for CS lab accounts), Fall 2015 – Spring 2017

- Faculty advisor for the Computer Science Club, Spring 2015 – Spring 2017
- Student Employment Committee, Fall 2015 – Spring 2016
- Ad-hoc committee to switch the language of instruction in CS110 from Java to Python, Spring 2015

College of Science and Mathematics, University of Massachusetts at Boston

- Advising, Counseling, and Supporting Committee, Fall 2021 –
- GRE (Math section) workshop for McNair fellows, Fall 2019, 2021
- CSM Scholarship Committee, Fall 2015 – Spring 2020
- Represented the Computer Science department at the Open House event for undergraduates, Fall 2015
- Represented the Computer Science department at the Welcome Day event for undergraduates, Spring 2015