Curriculum Vitae

Name Abhijit Suprem

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Discipline Computer Science and Engineering

Research My research areas of interest are Large Graph Query, Visualization, and Deep Learning.

Education

Graduate (Graduated 05/2017)
Track: Machine Learning

Department of Computer Science
Fu Foundation School of Engineering and Applied Sciences
Columbia University in the City of New York
116th St & Broadway, New York, NY 10027

Undergraduate (Graduated *Cum Laude* with Honors 05/2016):
Major: Electrical Engineering
Minors: (1) Computer Engineering, (2) Mathematics

Smittcamp Honors Scholar in the Smittcamp Family Honors College
Department of Electrical and Computer Engineering
Lyles College of Engineering
California State University, Fresno, 5140 N Maple Ave, Fresno, CA, 93740

RESEARCH ACTIVITIES (CLASS, FUNDED, AND INDEPENDENT PROJECTS)

- Autonomous steering for 4WD robot for motion planning
- Validation of Q-Learning algorithm in selecting shortest path for end-effector of a surgical robot
- Artificial Intelligence based original synthesis of music
- Implemented classification scheme to identify neural impulses and associated signal artifacts for implantable biosystems
- Characterization of predator-prey relationships with multi-objective evolutionary algorithms
- Hardware implementation and analysis of resonance-coupled wireless power transfer systems
- Development of GPS/IMU sensor fusion platform for position tracking in access-denied locations
- Dissemination of microprocessor courses through classroom and interactive cyber-enabled technologies, National Science Foundation USA (Project Award #1120000)
- Test rig development for action potential simulation to analyze microelectrode design integrity

WORK AND INTERNSHIP EXPERIENCE

Position	Organization	Duration	Description
Instructional Service Assistant Grader	Lyles College of Engineering (LCOE), California State University (CSU), Fresno	09/15/15 – 12/15/15	Grader for VLSI System Design (ECE 140)

Lyles College of Engineering Pathways Tutor	LCOE, CSU Fresno	09/01/15 – 05/01/16	Tutor for Upper-level Engineering and Mathematics subjects: Differential Equations, Signal Processing, Computer Architecture
Research Assistant	LCOE, CSU Fresno	07/01/15 – 12/31/15	Project on GPS/IMU integration for pedestrian position tracking in access-denied locations
Web Developer	Global Finance Association	10/20/13 – 12/31/13	Designed website and server backend for conference organization
Research Intern	Implantable Micro-Systems (IMS) Lab, Gwangju Institute of Science and Technology (GIST), South Korea	06/21/13 – 08/15/13	Worked on wireless power transfer applications for implantable microsystems Developed prototype platform for biosensor powering
Research Assistant (NSF Project #1120000)	LCOE, CSU Fresno	09/01/12 – 06/01/13	Designed website and database backend for NSF project Organized distance-learning workshops
Research Intern	Communications and Sensor Network Laboratory, GIST	06/01/12 – 08/25/12	Worked on artificial intelligence-based control system for agricultural mobile robots for pathfinding
Research Intern	IMS Lab, GIST	06/01/12 – 08/25/12	Worked on integrated test rig for the simulation of action potential pathways to analyze microelectrode design integrity
Website developer	Department of Agricultural Business, CSU, Fresno	12/31/11 – 01/25/12	Designed website for Western Collegiate Food and Marketing Competition organization Handled competition applications

AWARDS, HONORS, AND SCHOLARSHIPS

1. **Chair's Fellowship, 2017:** Offered by the Georgia Institute of Technology
2. **Electrical and Computer Departmental Doctoral Fellowship, 2016:** Received from the University of Texas at San Antonio
3. **Valero New PhD Competitive Research Award, 2016:** Received from Valero Energy Corporation
4. **Graduate Research Assistantship, 2016:** Received from School of Engineering at University of Texas at Dallas
5. **Graduate Research and Teaching Assistantship, 2016:** Received from Department of Computer Science and Engineering at University of Nevada, Reno
6. **Smittcamp Family Honors Scholarship, 2011-16**: This full-ride scholarship for undergraduate study is awarded to about 1% of the incoming undergraduate students and renewed based on academic performance, service, and leadership.
7. **Charles Buckley Engineering Scholarship, 2011-12, 2012-13**: I received this scholarship from the California State University, Fresno based on my academic performance and a personal statement regarding future career plans.
8. **Lyles Center Engineering Scholarship, 2013-14**: I received this scholarship from the California State University, Fresno based on my academic performance, community service, and leadership

in campus organizations as Historian in Tau Beta Pi (Engineering Honor Society) and Vice President in Eta Kappa Nu (Electrical Engineering Honor Society).

9. **National Institute of Health Fellowship, 2012**: I was selected to receive this fellowship from the National Institute of Health through the organizers of the IEEE Engineering and Medicine and Biology Society Conference, 2012, based on my research presentation at the conference.
10. **Best Student Paper Award, 2013**: The International Conference on Machine Learning and Data Analysis awarded me the Best Student Paper Award for my research presentation on statistical and stochastic methods for pattern finding in music compositions. The research was also selected for publication in the form of book chapter in the "Transactions on Engineering Technologies: Special Issue of the World Congress on Engineering and Computer Science".
11. **Certificate of Merit for Paper, 2013**: The International Conference on Intelligent Automation and Robotics awarded me the Certificate of Merit on my research paper presentation on the topic of artificial intelligence in mobile robot navigation.
12. **First Place at California State University Student Research Competition, 2016:** Received first place for research presentation on "Prototype Tabletop Wireless Power Transfer System: An Approach to Distributed Systems Charging Application" in Engineering and Computer Science.
13. **Second Place, American Society of Agricultural and Biological Engineers Conference, 2013**: My presentation on design and validation of precision end-effectors at the conference, California/Nevada Section, earned me a Second Place Award.
14. **Plenary Session Presenter, 2013-14**: I was selected from about 200 participants as one of the five plenary session presenters at the Central California Research Symposium to present a distance learning curriculum developed under an NSF grant (Award #1120000).
15. **Honorable Mention, Central California Research Symposium, 2015**: I received Honorable Mention for my presentation on hardware implementation of wireless power transfer.
16. **Lyles College of Engineering Innoventures Grant, 2015-16**: I was awarded this grant to purchase materials and software tools to develop a prototype tabletop wireless power transfer platform for device charging applications.1
17. **Undergraduate Research Grant, 2013-14**: I was awarded the Undergraduate Research Grant from my University to purchase materials in conducting research at the Gwangju Institute of Science and Technology in the Implantable MicroSystems Lab on methods for wirelessly powering in vivo neural biosensors.
18. **Grant from Anonymous Donor, 2012**: I received a travel grant from an anonymous donor through the Smittcamp Honors College to present my research work at the IEEE Engineering and Medicine Biology Conference, 2012.
19. **Selected for California State University Student Research Competition, 2012-15**: Out of about 200 participants, I was selected as one among ten delegates for the state-wide California State University Student Research Competition in the academic years 2012-13, 2013-14, and 2014-15.
20. **Honor Societies**: I am a member of the following honor societies based on my class standing (top 10% of my class) and community service:
    a. Tau Beta Pi (Engineering Honor Society; 2012-present)
    b. Eta Kappa Nu (Electrical Engineering Honor Society; 2014-present)
    c. Golden Key Honor Society (2012-present)
    d. National Society of Collegiate Scholars (2011-present)

SKILLS AND COMPETENCIES

- **Grant/Report Writing:**
  I have written student grant proposals through organizations for research projects.
    - **Lyles College of Engineering Innoventures Grant** to develop a prototype table-top wireless power transfer platform for device charging applications

- **Undergraduate Research Grant** to conduct research at Gwangju Institute of Science and Technology, South Korea, and to present my research results at the IEEE Engineering in Medicine and Biology Conference
- **Instructionally Related Activities Grant** for California State University Fresno Chapters of (i) IEEE, (ii) American Medical Students Association, (iii) Quizbowl, and (iv) Golden Key Honor Society

- **Computer Language and Tools**
  I have proficiency in the following software tools and programming languages on a scale of 1 (low) to 5 (advanced)
  - C/C++ (5)
  - Java (5)
  - Python (5)
  - MATLAB/Simulink (5)
  - Altera/Quartus VLSI Design (5)
  - JQuery, Ajax, Javascript (5)
  - LaTeX, XeTeX, BibTeX (5)
  - Verilog (5)
  - Mathematica (5)
  - PHP (4)
  - R (3)

JOURNAL AND CHAPTER PUBLICATIONS

1. Abhijit Suprem and Tarek Elarabi (2016). IMUs Based Orientation and Displacement Detection. *IEEE Open Access*. 987-997
2. Abhijit Suprem and Manjit Ruprem (2014). A New Composition Algorithm for Automatic Generation of Thematic Music from Existing Pieces. *Transactions on Engineering Technologies: Special Issue of the World Congress on Engineering and Computer Science.* Chap. 261-274.
3. Abhijit Suprem, Min Hyuc Ko, Kyoung Chul Kim, Beom Sahng Ryuh, Nitaigour Mahalik (2014). Autonomous Greenhouse Mobile Robot Driving Strategies from System Integration Perspective: Review and Application. IEEE/ASME Transactions on Mechatronics, 20(4): 1705-1716.
4. Abhijit Suprem, Min Hyuc Ko, Kyoung Chul Kim, N. Prem Mahalik, Boem Sahng Ryuh (2014). 4WD Mobile Robot for Autonomous Steering using Single Camera based Vision System. International Journal of Intelligent Unmanned Systems. 2(3). 168-182.
5. Abhijit Suprem, Nitaigour Mahalik, and Kiseon Kim (2013). A review on application of technology systems, standards and interfaces for agriculture and food sector. Computer Standards and Interfaces. 35(4): 355-364.

CONFERENCE AND SEMINAR PRESENTATIONS

1. Abhijit Suprem and Woonki Na (2016). Prototype Tabletop Wireless Power Transfer System: An Approach to Distributed Systems Charging Applications. *30th Annual California Student Research Competition at CSU Bakersfield.* April 30, 2015. Bakersfield, California, USA
2. Abhijit Suprem and Tarek Elarabi (2015). Orientation and Displacement Detection for Smartphone-Device Based Inertial Measurement Units. *IEEE International Symposium on Signal Processing and Information Technology 2015*. December 7-10, 2015. Abu Dhabi, UAE.
3. Abhijit Suprem and Nagy Bengiamin (2015). Hardware Implementation of Efficient and Robust Resonant Coupled Wireless Power Transfer System. *29th Annual California Student Research Competition at CSU San Bernadino*. April 23, 2015. Fresno, California, USA.

4. Abhijit Suprem and Gregory Kriehn (2014). Development of Cooperative and Competitive Evolutionary Algorithms to deal with Dynamic Constraint Parameters and Solution Stagnation. *28th Annual California Student Research Competition at CSU East Bay*. May 2, 2014. East Bay, California, USA.
5. Abhijit Suprem and Nagy Bengiamin (2014). Efficient Wireless Power Transfer (WPT) for Microscale Biosensors over Mid-Range Distance with Magnetically Resonant Coils. *Proceedings of the 35th Annual Central California Research Symposium*. April 24, 2014. Fresno, California, USA.
6. Abhijit Suprem and Sohee Kim (2013). Microsystem Framework for Pathogen Detection and Subsequent Data Collection and Analysis (Late Breaking Poster). In *IEEE Engineering in Medicine and Biology Society Conference*. July 3-7, 2013. Osaka, Japan.
7. Abhijit Suprem, Reza Raeisi (2013). Design and Development of Personalized Contents-feed App Intended for Web-of-Things. In *International Conference on Internet and Multimedia Technologies 2013, World Congress on Engineering and Computer Sciences 2013*, October 25, 2013. Berkeley, USA.
8. Abhijit Suprem, Manjit Ruprem (2013). A New Composition Algorithm for Automatic Generation of Thematic Music from Existing Pieces. In *International Conference on Machine Learning and Data Analysis 2013*, *World Congress on Engineering and Computer Sciences 2013*, October 25, 2013. Berkeley, USA.
9. Abhijit Suprem, Min Hyuc Ko, Kyoung Chul Kim, Beom Sahng Ryuh, Nitaigour Mahalik (2013). Development of Autonomous Traveling for Agricultural Robot Drive Platform by Using a Single Camera. In *International Conference on Intelligent Automation and Robotics 2013*, *World Congress on Engineering and Computer Sciences 2013*, October 25, 2013. Berkeley, USA.
10. Abhijit Suprem, DoHyun Kim, and Reza Raeisi (2013). Programming Reinforcement Learning Algorithm in LabVIEW Environment: An Example with Mobile Robot Navigation. In *Annual Conference on Engineering and Information Technology*, June 28, 2013. Seoul, South Korea.
11. Abhijit Suprem and Reza Raeisi (2013). Dissemination of Microcontroller Courses through Classroom and Interactive Cyber-Enabled Technologies. *27th Annual California Student Research Competition at CSU Pomona.* May 11, 2013. Fresno, California, USA.
12. Abhijit Suprem, Diganta Adhikari, and Gregory Kriehn (2013). Configurable Conceptual End Effector Design for Tree Fruit Harvesting. In *American Society Agricultural and Biological Engineers 2013 California –Nevada Section Annual Meeting*, Tulare Ag Expo, February 13, Tulare, CA, USA.
13. Abhijit Suprem, Steven Waenke, and Reza Raeisi (2013). Computer Aided Design (CAD) of blocking head for the impact sprinklers to improve water usage efficiency in row crops irrigation system. In *American Society Agricultural and Biological Engineers 2013 California-Nevada Section Annual Meeting*, Tulare Ag Expo, February 13, Tulare, CA, USA.
14. Abhijit Suprem, Diganta Adhikari, and Kiseon Kim (2012). A Study on Precision Frost Control Tools and Systems. In *Proceedings of 3rd Workshop on Marine Telemetics.* Korea Information and Communication Society, Mokpo National University, July 23, Mokpo, South Korea.
15. Abhijit Suprem (2012). Role of Gamma Parameter in Reinforcement Learning. Kumoh National Institute of Technology [Seminar]. July 15, Kumho, South Korea.
16. Abhijit Suprem (2012). Introduction to Q-Learning for Mobile Robot Navigation Applications. Communication and Sensor Network Laboratory, Gwangju Institute of Science and Technology [Seminar], August 14, Gwangju, South Korea.
17. Abhijit Suprem, Reza Raeisi, (2012). Validation of Q-Learning Algorithm for Selecting Shortest Path with End-Effector of a Surgical Robot: A Simulation Study. In *IEEE Engineering in*

Medicine and Biology Society Conference (706). August 27-31, 2012. San Diego, California, USA.

18. Abhijit Suprem, Sohee Kim, (2012). Development of an Integrated Test-Rig for the Simulation of Action Potential Pathways to Analyze Microelectrode Design and in vivo Performance. In *IEEE Engineering in Medicine and Biology Society Conference* (292). August 27-31, 2012. San Diego, California, USA.
19. Implantable Medical Systems (IMS) Lab Seminars, Gwangju Institute of Science and Technology (GIST), Gwangju, South Korea, 2012
    a. Abhijit Suprem (2012). Neural Signal Pathways in the Human Brain. IMS Lab, GIST [Seminar]. June 26, 2012
    b. Abhijit Suprem (2012). Preliminary Results from Developed Test-Rig for Microelectrode Testing. IMS Lab, GIST [Seminar]. July 10, 2012
    c. Abhijit Suprem (2012). Parametric Study of a Simplified Reinforcement Learning Model. IMS Lab, GIST [Seminar]. July 27, 2012
    d. Abhijit Suprem (2012). Final Results from Developed Test-Rig for Microelectrode Testing. IMS Lab, GIST [Seminar]. August 8, 2012

COMMUNITY SERVICE ACTIVITIES

Volunteer Description	**Organization**	**Year**	**Hours**
Mentor (Regional Science Fair) Mentored students (Grades 6-12) in Central California Science, Engineering, and Mathematics Science Fair	Clovis Unified School District, Clovis, CA, USA	2010-15	100
Mentor (FIRST Lego League (FLL)) Elementary and intermediate students competed in FLL Regional tournaments	Central Valley Robotics, Fresno, CA, USA	2010-13	200
Mentor (FIRST Robotics) Taught high school students Computer-Aided Design techniques, Programming, and Electronics design for building robots for FIRST state championships	TEAM 1671, Buchanan High School, Clovis Unified School District, Clovis, CA, USA	2012-15	225
Mentor and Judge Mathematics, Engineering, Science Achievement (MESA) volunteer through local IEEE chapter	IEEE – California State University, Fresno Chapter	2012-15	40
		TOTAL	565