Department of Electrical Engineering and Computer Science

Electrical Engineering and Computer Science Day
Friday, April 19, 2019

At
Howard University
INNOVATION CENTER
Mackey Building, 2336 Sixth Street, Northwest
Washington, DC 20059

Keynote Speaker: Rani Borkar, Microsoft Corporation

Rani Borkar

Corporate Vice President
Cloud Capacity and Supply Chain Organization
Microsoft Corporation

Ms. Borkar is a senior technology executive and product visionary with 25+ years of experience leading product development for Personal Computing, Enterprise and Cloud markets. She has held executive engineering leadership roles at top technology companies and has a proven track record of launching new silicon platforms in hyper-growth competitive markets and growing shareholder value. She has broad executive experience across general management, business strategy, engineering and product strategy.

In late 2017, Rani became Corporate Vice President for Microsoft's Cloud Capacity and Supply Chain Organization. In this role, she leads Capacity planning, sourcing and provisioning for all Microsoft Cloud. Borkar is responsible for accelerating Microsoft's cloud and edge computing capability with a primary focus on planning capacity and forecasting demand, managing all aspects of Cloud infrastructure supply chain, and delivering servers and networking to Microsoft Data Centers worldwide. In addition, Borkar owns all aspects of global capacity deployment in Microsoft data centers for both network and servers.

Prior to this role Borkar spent a year at IBM as the Vice President of OpenPOWER development, leading their silicon strategy for servers. Prior to IBM, Borkar spent 25+years in a variety of engineering leadership roles at Intel. She led Intel's silicon product development to fuel the growth of the PC, Server & Data Center, IoT, Phone/Tablet business. Her track record of success includes scaling Intel's product development to deliver a wide portfolio of world-class microprocessors.

Ms. Borkar is progressive and transformative leader with extensive experience in leading large, complex and diverse world-wide engineering organizations. She believes in creating change-ready organizations, building a results-oriented culture, developing strong leaders and nurturing close-knit communities. Ms. Borkar is active in the community - mentoring the next generation of leaders and advancing STEM education to underrepresented youth. A respected thought leader and speaker she is invited for multiple conferences and panels. She is a member of the Global Advisory Board for the Conference Board and serves as the Chair of Board of Trustees at Oregon State University. In this role, she helps guide the state's effort to advance economic development and innovation.

Borkar holds two Master's degrees, one in Physics and one in Electrical Engineering. She completed the Executive Program in Leadership (LEAD) at the Stanford Graduate School of Business and the Global Executive Leadership (GEL) program with The Conference Board.

Schedule of Activities

8:30 am – 9:00 am   **Registration and Breakfast**

9:00 am – 9:15 am   **Welcome and Overview**
Dr. Ahmed Rubaai, Chairman
Department of Electrical Engineering and Computer Science
Dr. Achille Messac, Dean
College of Engineering and Architecture

9:15 am – 11:45 am   **Senior Design Presentations**

Session 1: Innovation Center – Electrical and Computer Engineering Projects

9:15 am – 9:30 am   **Team 1:**
Project Title: AutoMoe ("Autonomous Car")
Faculty Advisor: Dr. Danda Rawat (CS)
Team Member(s): Satchin Campbell (CpE),
Samantha-Jo Cummingham (EE)
Pawan Gaire (EE)
Savannah McCoy (CpE)

- **Project Goal:** Design and develop two autonomous car prototypes capable of privacy-aware inter-communication.
- **Problem Statement:** Implementation of a secure smart-system for autonomous vehicles will reduce the number of accidents caused by drunk driving, distracted or reckless driving, speeding, and blind-spots which allows for more productive commute time and overall safer transportation.

9:30 am – 9:45 am   **Team 2:**
Project Title: eTrike ("Electric Tricycle")
Faculty Advisor: Dr. Mamadou Wade (EE)
Team Member(s): India Burse (CpE)
Tramia Johnson (CpE)
Akinyemi Morakinyo (EE)
Ayana Walker (EE)

- **Project Goal:** Development of energy-saving battery-operated electric tricycle.
- **Problem Statement:** The e-Trike aims to create a standard, dependable, user friendly comprehensive solution that consolidates the productivity of a bicycle with the solace of a mechanized automobile to enhance comfort, lessen costs, and be more vitality cognizant.

9:45 am – 10:00 am   **Team 3:**
Project Title: Graphone ("Graphene Microphone")
Faculty Advisor: Dr. Hyung Bae (ME)
Team Member(s): Sheriff Adewumi (EE)
                  Harrell Tolentino (CpE)

- **Project Goal:** Construction of circuits and PCBs to implement the graphene microphone for use in audio signal location.
- **Problem Statement:** The project aims to enable the benefit of graphene-based microphone to be realized on a circuit board, and can be applied to audio signal location with comparison with the conventional electret counterpart.

10:00 am – 10:15 am   **Team 4:**
Project Title: Sandia
("Sandia Lab Senior Design Bonanza Competition)
Faculty Advisor: Dr. Grant Warner (ME)
Team Member(s): Nadine-Marie Bell (EE)
                  Michelle Chastang (CpE)
                  Hakeem Thomas (EE)
                  Stephen Young (EE)

- **Project Goal:** Design an integrated sensor device to sense environmental conditions as required by the Sandia Bonanza Competition.
- **Problem Statement:** The customer (Sandia) needs a small (size specific) and efficient device which operated on low power and responds to its environment when necessary, which will send and provide data on the different environments in which the customer deploys their systems and components.

10:15 am – 10:30 am   **Team 5:**
Project Title: SLAM
("FPGA-based Solving Localization and Mapping (SLAM) for Autonomous Platform")
Faculty Advisor: Dr. Michaela Amoo (CpE)
Team Member(s): Jarrett Cunningham (CpE)
                  Cameron Lewis (CpE)
                  Clifford Peeples (CpE)
                  Morganne Veal (EE)

- **Project Goal:** Design and build an autonomous wheeled platform which becomes a baseline for FPGA-based implementation
- **Problem Statement:** This project will design, build, and test an autonomous wheeled platform using COTS components, comprising industry standard PID and Bang-Bang controllers, and sensor arrays (IR Ranger and Scanless Lidars), and establish baselines to evaluate the performance of application specific FPGA-based SLAM processor(s).

10:30 am – 10:45 am   **Team 6:**
                           Project Title: Terminator ("Tic-Tac-Toe Playing Robot")
                           Faculty Advisor: Dr. Charles Kim (EE)
                           Team Member(s): Marcus Ragland (EE)
                                                Charles Robinson (EE)
                                                Owens Vil (EE)

- **Project Goal:** Development of a tic-tac-toe playing robot
- **Problem Statement:** The project aims to build, using a robot-arm, a robot tic tac toe player which is equipped with camera captured image-based mark or piece recognition and with strategy of combinatorics and searching game trees.

Session 2: Innovation Center – Computer Science Projects

9:15 am – 9:30 am   **Team 1:**
                           Project Title: Share Eat
                           Mentor/Advisor: Dr. Harry Keeling
                           Team Member(s): Anish Adhikari
                                              Biswash Adhikari
                                              Saugat Triptahi
                                              Susan Bhattarai
                                              Darpan Chaudhary

Abstract: An app where people can share home-cooked food, get paid and foster a sense of community. This app is for both people who do not like to cook at all and people who are fond of cooking.
- For food-makers: Get paid for sharing home-made food.
- For food-buyers: Conveniently order home-cooked food at affordable prices.

9:30 am – 9:45 am   **Team 2:**
                           Project Title: Peddler
                           Mentor/Advisor: Dr. Harry Keeling
                           Team Member(s): Xavier Ward
                                              Brittany Ohalet
                                              Jahlil Allen

Abstract: Peddler serves as a centralized place for college students to buy and sell items/services on their own campus. Users have the ability to query the database for items/services they're looking to buy or upload items/services they're looking to sell. Peddler reduces the trouble of waiting weeks, and sometimes months, to receive packages from eBay or other resell sites. Knowing that they're buying from their fellow peers also helps to comfort students. Peddler will help aid in the growth of the various entrepreneurs on college campuses as well as simplifying student's search for cheap items on their own campus.

9:45 am – 10:00 am   **Team 3:**
                           Project Title: HUColab8
                           Mentor/Advisor: Dr. Harry Keeling
                           Team Member(s): Prashant Bhandari
                                              Shrijan Aryal
                                              Suraj Upreti
                                              Sumnima Joshi

Abstract: Using our application, Howard students can log in to post their idea or any topic they want to discuss about. The authentication features will make sure that only Howard Students can sign up and login to the application.
The application will serve as a database of the discussion threads. Students can also categorize their idea/topic according to pre-specified topics (major related like CS, Mechanical Engineering, Political Science, Physics, Chemistry etc.) Then other students can go to that category (tag) and then see the posted idea. Then we will also integrate private chat service in the application so that students can further discuss on that idea and collaborate on discussing it further.

10:00 am – 10:15 am　　　　　**Team 4:**
　　　　　　　　　　　　　　Project Title: PrepCS
　　　　　　　　　　　　　　Mentor/Advisor: Dr. Harry Keeling
　　　　　　　　　　　　　　Team Member(s): Shrijanand Chintapatla
　　　　　　　　　　　　　　　　　　　　　　David Awogbemila
　　　　　　　　　　　　　　　　　　　　　　Ellis Crawford

Abstract: Our product is a network proxy that will not only mitigate the effects of scanty internet connection between a client and a specific server (ergo, a shopping service) but also create a robust pathway that is not dependent on reliable internet connections and is tolerant towards disruption and disturbances. We will create an application which, when downloaded to a client's computer, will act as an intermediary between the client's browser and a specified shopping/e-commerce service to allow the client access to the website's content when internet is unavailable and complete the client's requests (Ex: the booking of an order) to the website on behalf of the user when a connection becomes available (without any further human input or interaction).

10:15 am – 10:30 am　　　　　**Team 5:**
　　　　　　　　　　　　　　Project Title: InterviewBot
　　　　　　　　　　　　　　Mentor/Advisor: Dr. Harry Keeling
　　　　　　　　　　　　　　Team Member(s): Swapnil Tamrakar
　　　　　　　　　　　　　　　　　　　　　　Pratyush Thapa
　　　　　　　　　　　　　　　　　　　　　　Sumit Dhungel
　　　　　　　　　　　　　　　　　　　　　　Rajjwal Rawal
　　　　　　　　　　　　　　　　　　　　　　Aarya BC

Abstract: InterviewBot is a phone interview bot that takes technical phone interviews for companies. It allows an interface for interviewees to hear the questions in detail, write programs, get hints when they get stuck, and also record their performance. It allows interviewers to view the performance and audio recording of the interviewees. This allows an easy way to screen them for further recruiting.

10:30 am – 10:45 am　　　　　**Team 6:**
　　　　　　　　　　　　　　Project Title: Sub Tracker
　　　　　　　　　　　　　　Mentor/Advisor: Dr. Harry Keeling
　　　　　　　　　　　　　　Team Member(s): Aashish Pokhrel
　　　　　　　　　　　　　　　　　　　　　　Aakash Basnet
　　　　　　　　　　　　　　　　　　　　　　Ashok Kafle
　　　　　　　　　　　　　　　　　　　　　　Binit Koirala
　　　　　　　　　　　　　　　　　　　　　　Abhiyan Sapkota

Abstract: The product, Online Subscription Manager, will keep track of online subscriptions for a user. This will include details of the subscriptions such as the duration subscribed for, amount of subscription fees etc. The user will be notified of events such as the subscription expiry dates, change in subscription fees.

10:45 am – 11:00 am   **Team 7:**
                             Project Title: Belp
                             Mentor/Advisor: Dr. Harry Keeling
                             Team Member(s): Jeff Beauplan
                                                Daniel Erhabor

Abstract: Belp is a black business directory that helps people find black owned businesses near them. Belp connects black business owners with potential customers.

11:00 am – 11:15 am   **Team 8:**
                             Project Title: CTF Providence Intrusion Detection
                             Mentor/Advisor: Dr. Gedare Bloom
                             Team Member(s): Andre Campbell
                                                 William Bell

Abstract: Our product is an intrusion detection system that analyzes the logs from IoT device sensors to identify intrusions and locate vulnerabilities.

11:15 am – 11:30 am   **Team 9:**
                             Project Title: IoT Blocks
                             Mentor/Advisor: Dr. Gloria Washington
                             Team Members: Andriana Burgess
                                               Cynthia Jules
                                               Brandon Cole
                                               Tashambra Williams

Abstract: The design space of IoT applications is enormous, so this project narrows down to a single IoT system, cloud platform, and user app. We will use a block programming tool called Ardublock to create the interface the user would interact with. The IoT system that is to be programmed is a BeagleBone Black device, the cloud platform will be the stock AT&T M2X system, and the user app will be created using AppInventor.

11:30 am – 11:45 am   **Team 10:**
                       Project Title: Pride
                       Mentor/Advisor: Dr. Harry Keeling
                       Team Members: Gideon Driver
                                         Keenah Mays
                                         Lauren Clayton
                                         Christina Robinson

Abstract: We are creating a game in which you play as a pride of lions and the objective is to keep your family alive through trials such as starvation, encroaching competing predators, and natural disasters. The different lions in your pride have different character traits which determine their effectiveness at certain tasks and the player must keep these characteristics in mind when deciding what tasks to send them on to ensure that the pride survives.

11:45 am – 12:00 pm   **Team 11:**
                       Project Title: Inflooence
                       Mentor/Advisor: Dr. Harry Keeling
                       Team Members: Deeshai Escoffery
                                         Timothy Hitchener

Abstract: Inflooence is a platform which connects philanthropists to the organizations and causes that have a proven record of service to the community. Organizations may post their accomplishments or community events so that people who wish to donate can give to causes truly worthy of support.

12:00 pm – 1:00 pm   **Lunch**

1:00 pm – 1:45 pm   **Remarks and Introduction of the Keynote Speaker**

1:45 pm – 2:15 pm   **DEMO/POSTER PRESENATION**

2:15 pm – 3:00 pm   **Awards**

3:00 pm   **Adjourn**