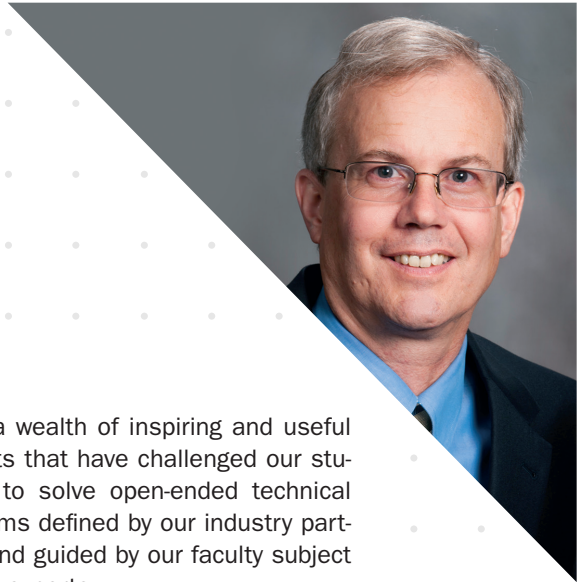# ece 4805/4806

Two-semester Senior Design Capstone

Poster Paper Event

April 15, 2016
The Inn at Virginia Tech

Senior Design, or "capstone" as it is also known, is a culminating experience for undergraduate students during which they have the opportunity to combine all the technical, communication and teamwork skills that they have learned in one exciting and meaningful project. Whether a student's career interests lie in working for industry, continuing on for an advanced degree, or pursuing a job in our national labs, the capstone experience is an opportunity to define how they will impact the technical community or society in general.

After last year's initial success with combining a two-semester format with industry sponsorship, we were pleased this year to offer it again and to expand both the number of possible projects and the availability of the course to our Masters of Engineering (MEng) students as well. I think that you will agree with me that the result has been a wealth of inspiring and useful projects that have challenged our students to solve open-ended technical problems defined by our industry partners and guided by our faculty subject matter experts.

I was very pleased to have Professor of Practice Gino Manzo back again as the lead instructor for this two-semester course, and to recruit an ECE Industrial Advisory Board member, Ken Schulz of Lockheed Martin, to contribute his expertise in a supporting role. Ken and Gino's combined experience and insight is invaluable to our students in preparing them for the next step in their engineering careers beyond graduation.

Congratulations to all the students for their dedicated efforts and thanks to our industry sponsors, instructors and subject matter experts for their tremendous support in this endeavor.

Luke Lester
Professor and Head
Bradley Department of ECE
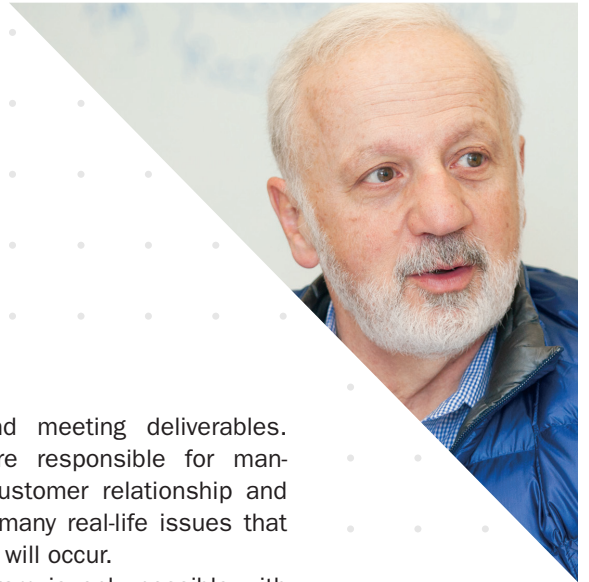
April 15, 2016

Welcome and thank you for attending our second annual Two-Semester Senior Design Capstone Poster Paper Event!

Today we are celebrating the achievements of 98 students who have diligently worked on 24 diverse industry problems. This represents a 60 percent increase in student enrollment and 50 percent increase in sponsored projects from those in our inaugural year.

The goal of this class is to provide students with a "real-life" industry project as part of their major design experience during their senior year. Student teams work with sponsors, who are the customers. With advice from subject matter experts, they complete a meaningful engineering project. This project is managed exactly as if the students were just hired by a company and placed on an engineering team. Students are responsible for generating the project plan and then executing the plan. Throughout the two semesters, they are guided in technical areas by the subject matter experts, and mentored by the instructors in a host of professional and business skills, such as communication, teamwork, ethics, professionalism, company values, metrics, and new-business acquisition. By working in teams, they develop leadership and group interpersonal skills and deal with schedule conflicts and meeting deliverables. Students are responsible for managing the customer relationship and solving the many real-life issues that undoubtedly will occur.

This program is only possible with the dedicated support from our sponsors and subject matter experts whom we whole-heartedly thank for their unwavering assistance. Thank you for engaging with our program and helping make our students more valuable.

I also want to acknowledge and thank Dr. Luke Lester for initiating this class at Virginia Tech and providing me the opportunity to grow and learn. This has been a wonderful and enriching experience that would not be possible without Dr. Lester's continued and unyielding support. Thank you Dr. Lester!

The growth in student enrollment and projects allowed us to have Ken Schulz join our team as an adjunct professor of practice. Ken provided new ideas, mentoring, and leadership that was critical to the success of our larger class. I look forward to working with and supporting Ken in the future. Thank you Prof. Schulz!

Finally, we want to thank our students, who were brave enough to try something new. Stepping out of your comfort zone is always a valuable learning experience.

We wish you all the best as you pursue your aspirations.

Sincerely,

Gino Manzo
Two-Semester ECE Senior Design Capstone Instructor

Professor of Practice

"This class provided us with a huge amount of training to help one smoothly transition from school to corporate world."

"The class taught me how to function better in a team and be a better team leader."

TODAY'S PROGRAM

11:00–11:30 AM	**Sign-in, review posters**
11:30- 12:40 PM	**Welcome**—Prof. Gino Manzo **Remarks**—Dr. Luke Lester, Department Head **Short team presentations**
12:40–2:30 PM	**Lunch, review posters**
2:30 PM	**Best Paper Awards**
3:00 PM	**Adjourn**

All guests *are requested to vote for a Best Paper*

Every vote counts

"This capstone is an amazing opportunity to learn about industry-level project management, teamwork, and apply knowledge gained throughout a four-year college career. "

"...this class defined what a hands-on experience truly is."

Our Sponsors

With gratitude and appreciation for your dedicated support

Freescale

General Electric

General Motors

INMARSAT

Intel Corp

Iridium Communications

John Hopkins University
Applied Physics Laboratory

Lockheed Martin

Micron Technology

Qualcomm

United Technologies

Virginia Tech ECE

Virginia Tech IT

Zeta Associates

Innovative Computer Engineering (ICE)

Project Leadership

This class is only possible *because of the commitment, dedication and spirit of the following Customers and Subject Matter Experts.* *Thank you!*

SPONSOR/CUSTOMER	PROJECT/ SUBJECT MATTER EXPERT
Freescale Semiconductor, Austin, TX	Test Circuit Design and Evaluation of LV LDMOS
Scott Marshall	*Dong Ha*
General Electric, Salem, VA	Interface and Design Sensor
Rodney Clemmer, Brian Holzman	*Bill Plymale*
General Electric, Salem, VA	Web-enabled High Voltage Waveform Generator
Rodney Clemmer, Brian Batteiger	*Rolando Burgos*
General Electric, Niskayuna, NY	Web-enabled Secure Industrial Control System
Wesley Skeffington	*Cameron Patterson*
General Motors, Detroit, MI with VTTI*	Vehicle Cybersecurity Watchdog Device
Keith Van Houten, Zac Doerzaph	*Bill Plymale*
General Motors, Detroit, MI with VTTI*	Bluetooth Interface Software for Off the Shelf OBDII Bluetooth Dongle
Keith Van Houten, Zac Doerzaph	*Sook Ha*
INMARSAT, Washington, DC	Develop Low Rate Under Communications Capability
Perter Hadinger, Wendy Votaw	*Walid Saad*
Intel Corp, Hillsboro, OR	Resistive Switching Memory and Reliability
Sean King	*Marius Orlowski*
Iridium Communications, McLean, VA	Develop a Satellite Telephony Modem Auto-dialer System
Garret Chandler	*Mark Jones*
John Hopkins University Applied Physics Laboratory, Laurel, MD	Wireless Clock Synchronization for Distributed RF Systems
Michael Newkirk, Jeffrey Nanzer	*Louis Beex*
John Hopkins University Applied Physics Laboratory, Laurel, MD	UAS Meteorological Sensor
Michael Newkirk, Thomas Haley	*Scott Bailey*
Lockheed Martin, Moorsetown, NJ	IC Building Blocks, Design, Simulation
Peter Delos	*Dong Ha*

*Virginia Tech Transportation Institute

SPONSOR/CUSTOMER	PROJECT/ SUBJECT MATTER EXPERT
Lockheed Martin, Denver, CO	Asymmetric Material Design Analog Circuit
Edward Pierson	*GQ Lu*
Lockheed Martin, Moorsetown, NJ	FPGA-Based Switch Circuits
Rich Pedersen	*Patrick Schaumont*
Micron Technology, Manassas, VA	Developing Dry Etching Processes for 2D materials
Zuzana Steen, Kevin Hicks, Thomas Joseph	*Xiaoting Jia*
Micron Technology, Manassas, VA	Antireflection Coating for Photovoltaics
Zuzana Steen, Kevin Hicks, Thomas Joseph	*Wei Zhou*
Qualcomm, San Diego, CA	Realtime Mosaicking with Snapdragon - Hokie Vision
Abhijit Khobare, David Howard	*Lynn Abbott*
Qualcomm, San Diego, CA	Realtime Mosaicking with Snapdragon - SnapVision
Abhijit Khobare, David Mayer	*Harpreet Dhillon*
United Technologies, Vergennes, VT	802.15.4 Wireless Packet Capture Device
Satish Narayanan, Christopher Fitzhugh, Radek Zakrzewski	*Allen Mackenzie*
United Technologies, Vergennes, VT	4.2-4.4 Ghz Wireless Communication
Satish Narayanan, Christopher Fitzhugh, Radek Zakrzewski	*Walid Saad*
United Technologies, Rockford, IL	Additive Manufacturing of Magnetic Components
Satish Narayanan, Adam White, John Sagona, Mustansir Kheraluwala	*GQ Lu*
Virginia Tech ECE	ECE Inventory Control System
Luke Lester, Kathy Atkins	*Paul Plassmann*
Virginia Tech IT	Develop Mobile Single Sign-on Solution
Scott Midkiff, Karen Herrington, Ernest Penland, Kalpana Kethineedi	*Sook Ha*
Zeta Associates and Innovative Computer Engineering (ICE), Fairfax, VA	Design, Build, Test Personal Locator Beacon Architecture
Steve Hauser, Benjamin Beasley	*Loius Beex*

Special Acknowledgements

In addition to our project sponsors and subject matter experts, there were many others that significantly contributed to the success of this class. We want to take this opportunity to express our deep-felt appreciation and thanks for their contributions.

ECE 4805-4806 Guest Speakers

(IN ORDER OF APPEARANCE)

Mr. Cesare Caprio
BAE Systems (retired)
Program Management, Resume Reviews, Mentoring

Dr. Dennis Sweeney
Virginia Tech – ECE
Design Studio Safety Training and Material Procurement Instruction

Mr. Michael Miller
Virginia Tech – Intellectual Properties
Innovation and Intellectual Property Management

Ms. Michele Mayberry
New River Valley IP Law
Intellectual Property Issues for Recent Grads
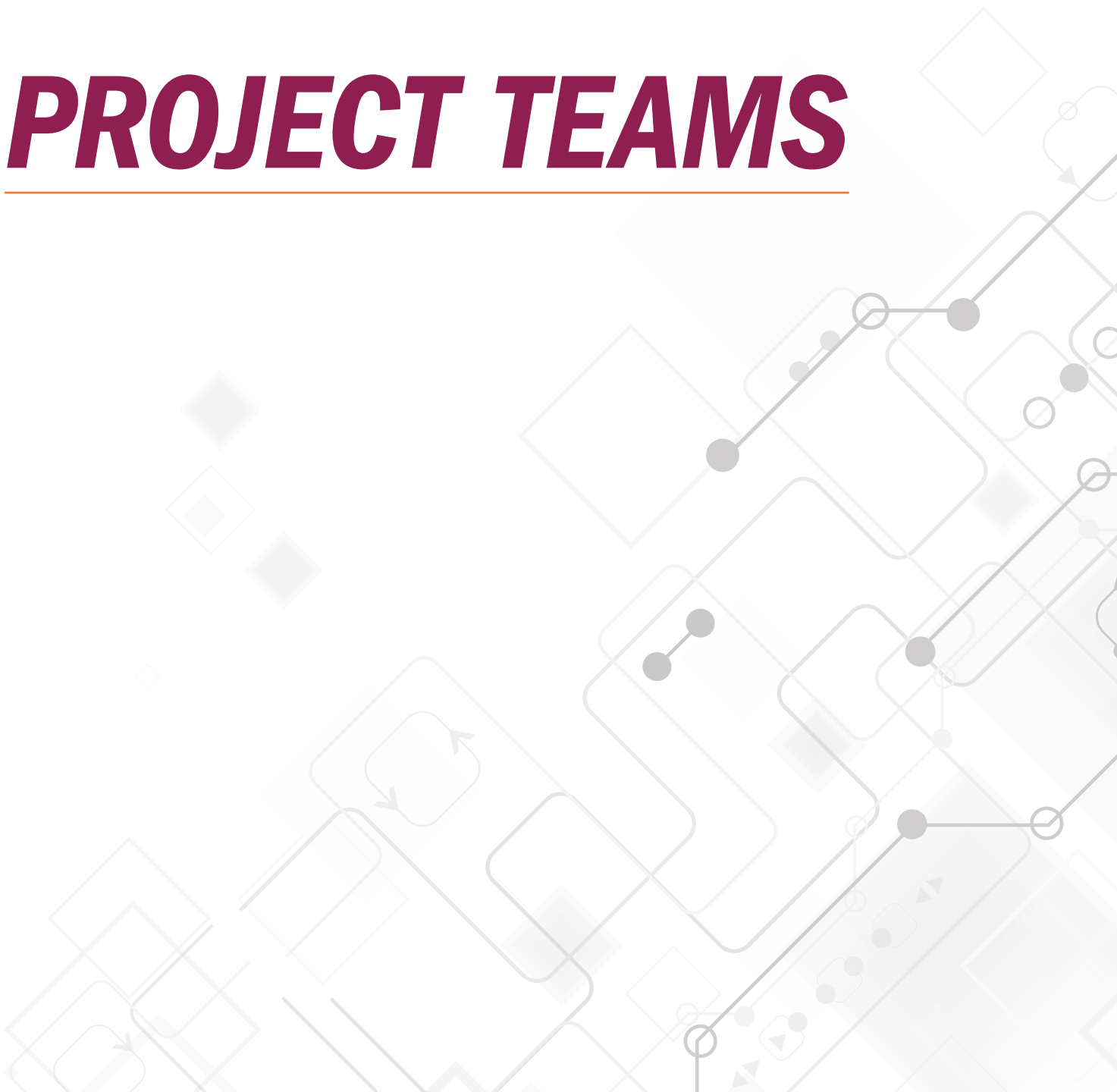
Mr. Ken Schulz
Lockheed Martin and Assistant Teaching Professor
Ethics and Professionalism

Mr. Toby Meadows
NAVAIR
Leadership

Special thanks also to **Mr. Ben Conlon** and **Mr. Mohammad Al-Mamun**
Teaching Assistants for the Intel and Micron Projects.
Provided excellent safety, tool, semiconductor processing, and mask design training.
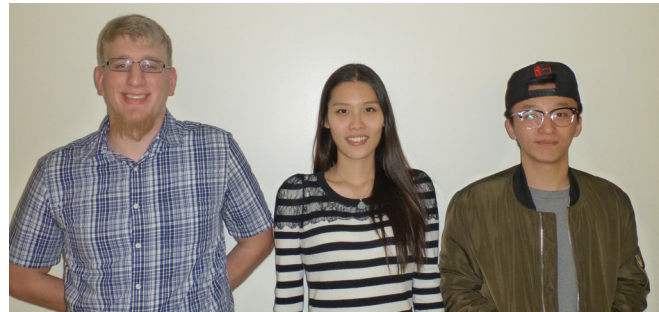
PROJECT TEAMS

Test Circuit Design and Evaluation OF LVDMOS

Freescale Semiconductor, Inc.

Challenge:

Characterize prototype SOT89 MOSFET Transistor to be used for Radio Frequency circuits and design Low Noise Amplifier based on the data from characterization of the transistor.

Jacob Mullins, Yueyang Sun, Peilin Zhang

JACOB MULLINS

CARTERSVILLE, VA

Electrical Engineering, interest in electronics and Intergrated Circuits.

ASPIRATIONS:
Work in Department of Defense engineering new techonology for the military.

CLASS COMMENT:
Learned many different aspects of project management, along with techincal skills.

PEILIN ZHANG

JIANGSU, CHINA

Electrical Engineering, interest in communication and RF/ IC Circuits.

ASPIRATIONS:
Work in the field of electronics, grow as an individual who is experienced in this industry.

CLASS COMMENT:
Learned how to work as a team, concepts about RF Circuit.

YUEYANG SUN

HENAN, CHINA

Electrical Engineering, interest in electronics and Integrated Circuit Design.

ASPIRATIONS:
Work in an electronics or semiconductor producing company after pursing a master degree.

CLASS COMMENT:
Gained industrial based experience on Radio Frequency Integrated Circuits while working in a group.

Interface and Design Sensor

General Electric

Challenge:

GE needs a simple con-critical I/O system. This I/O needs FPGA as a controller and data storage device. It also needs to use standard I2C protocol to transfer data from the sensor to the controller. The designed system must include the following detection functions: humidity, temperature, relay contact outputs and contact inputs. Our team needs to write FPGA controller code in Verilog, generate block diagrams for the system and the standalone modules, and determine the operating specifics.

Chang Sun, Shuang Cheng, Akshatha Kini, Bing Qi, Colin Burgin

COLIN BURGIN

BUFFALO, NEW YORK
Computer Engineering

ASPIRATIONS:
Hardware/Software working on high performance devices, FPGA's, etc.

CLASS COMMENT:
I liked that this class offers student a way to meet with a lot of very smart people in both academia and industry. This is something that you cannot get from any other class.

BING QI

BEIJING, CHINA
Computer Engineering

ASPIRATIONS:
Hardware embedded engineer.

CLASS COMMENT:
I have learned a lot of real world project managing experiences and industrial standard programing technique.

CHANG SUN

NANJING, CHINA
Computer Engineering

ASPIRATIONS:
Become an innovative software designer, constantly contributing to the industry.

CLASS COMMENT:
Perfect opportunity for interfacing with real customers and managing year-long projects under the guidance of professional, patient and enthusiastic mentors.

AKSHATHA KINI

BANGALORE, INDIA
Computer Engineering

ASPIRATIONS:
Grow as an individual and a VLSI embedded systems engineer in the field of digital electronics.

CLASS COMMENT:
Amazing opportunity to work as a team and build an exciting project for real world use.

SHUANG CHENG

ZHENGZHOU, CHINA
Electrical Engineering

ASPIRATIONS:
Be an electrical engineer in optical fiber.

CLASS COMMENT:
Learn more about how to do a project in real life, and a chance to know more about computer engineering.

Web-Enabled High Voltage Waveform Generator

General Electric

Challenge:

*Develop a high voltage waveform generator to meet
the following specifications:*

- *Output voltage range: up to 400 Vpp;*
- *Output frequency range: 1 Hz to 200 Hz;*
- *Output current range: below 30 mA;*
- *Using PA98 Op-Amp to boost input voltage up to 400 Vpp;*
- *Designing current limiting function by adjusting external resistor of Op-Amp;*
- *Designing DC-to-DC boost converter to boost the feeding voltage of Op-Amp.*

XIAOLAN ZOU

FAIRFAX, VA

Senior in Electrical Engineering. Interested area: Power System.

ASPIRATIONS:
Have my own engineering business.

CLASS COMMENT:
Learning leadership and communication skills by working with consumers. Improving my problem solving skills by working on project.
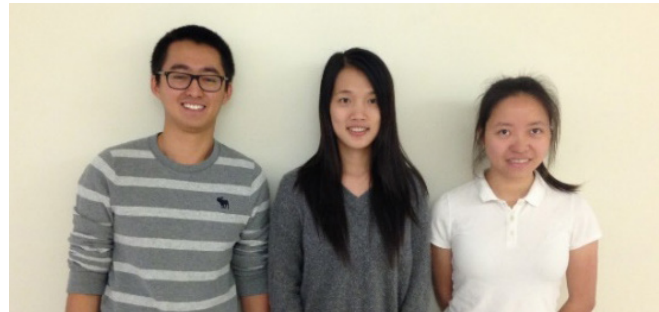
SHUCHEN YUE

NANJING, CHINA

Senior in Electrical Engineering. Interested area: Power Electronics and ICs Design.

ASPIRATIONS:
Lead and start my own technical business.

CLASS COMMENT:
Learning team management and communication skills by dealing with consumers.

Shuchen Yue, Xiolan Zou, Yuchan Lu

YUCHAN LU

CHENGDU, CHINA

Senior in Electrical Engineering. Interested area: Power Electronics.

ASPIRATIONS:
Contribute as a skilled electrical engineer in power electronics related to renewable energies.
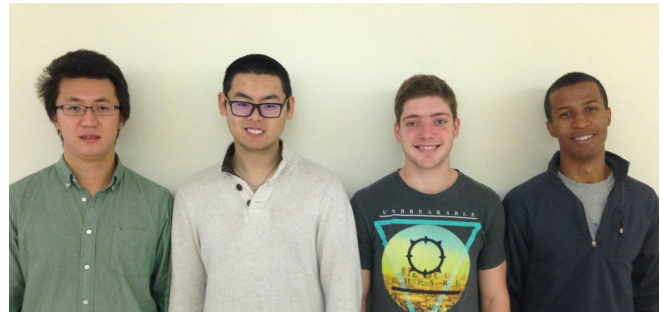
CLASS COMMENT:
The class provides me the opportunity to gain real world working experience including hands on experience and communication skills.

Web-Enabled Secure Industrial Control System

General Electric

Challenge:

To develop a secure software hierarchy that allows applications engineers to develop applications that interface with industrial protocols. Specifically, it will allow interfacing with the OPCUA protocol and will support adding device libraries in the future.

Ruizhe Song, Mingrui Zhao, Ryan Curtis, Daniel Davenport

RYAN CURTIS

CHRISTIANSBURG, VA

Electrical and Computer Engineer, interested mostly in software design.

ASPIRATIONS:
Work as a computer engineer and continue to learn.

CLASS COMMENT:
This class has given us a unique insight into the process of contracting and completing a real world engineering project.

DANIEL DAVENPORT

STAFFORD, VA

Computer Engineer with interest in embedded systems.

ASPIRATIONS:
To work and contribute as a computer engineer.

CLASS COMMENT:
The class has introduced us to how engineering companies win contracts, organize and work on designs, and experience working for a customer.

RUIZHE SONG

CHINA

Electrical Engineer, interested in circuit design.

ASPIRATIONS:
Contribute and learn from this class as an electrical engineer.

CLASS COMMENT:
I obtained real-world engineering experience and technical knowledge from this class. This experience has been most important.

MINGRUI ZHAO

CHINA

Computer Engineer with interest in software design.

ASPIRATIONS:
Contribute as software engineer in a tech company.

CLASS COMMENT:
This class has let us solve real world problem with new tools and given us experience on how to handle customer relationships.

Vehicle Cybersecurity Watchdog Device

General Motors & VTTI

Challenge:

Develop a device that can protect the security of the vehicle network. The device is supposed to set up between the incoming devices and OBDII to check if the coming message is safe or not.
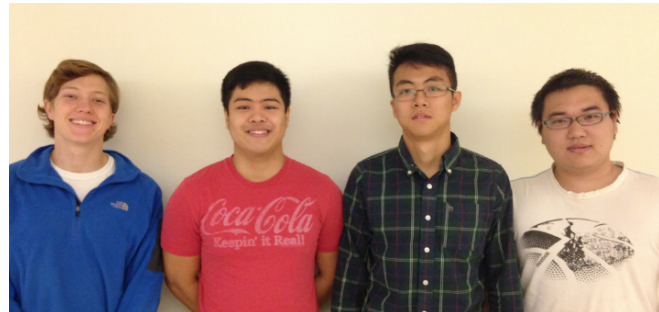
Joey Connor, Alex Nguyen, Runtian Lu, Chi Chen

JOEY CONNOR

ALEXANDRIA, VA

Electrical engineer interesting in microcontrollers and circuit design.

ASPIRATION:
Use electrical engineering skills to develop electronics devices and gadgets for entertainment and utility purposes.

CLASS COMMENTS:
This class has allowed me to understand the importance of concise communicating with a team that is striving after a common goal. Through better communication, our team has been able to hold each other accountable for our work and accomplish tasks quicker.

RUNTIAN LU

BLACKSBURG, VA

Electrical Engineering with interested in Power Electronics and Artificial Intellegence.

ASPIRATION:
Pursuing a graduate degree in EE and want to be a professor to teach and do research and devleopment on my own interests to contribute to the society.

CLASS COMMENTS:
This course provided great experiences on how to communicate with customer, how to make plan, work with teamates and how to work efficiently. Also, it gives me chance to learn new information which is exciting and challenging.

ALEX NGUYEN

ANNANDALE, VA

Electrical Engineering with a Cybersecurity minor.

ASPIRATION:
I hope to work in the cybersecurity field and be able to protect technology against modern day cyber threats.

CLASS COMMENTS:
The two semester senior design course is a great way for students to achieve hands on experience on the workings of the industry by working in teams to fulfill the needs of a customer.

CHI CHEN

BLACKSBURG, VA

Electrical Engineering interested in hardware and embedded system design.

ASPIRATION:
Contribute as a hardware engineer at some technology company. Pursuing a graduate degree for Electrical Engineering.
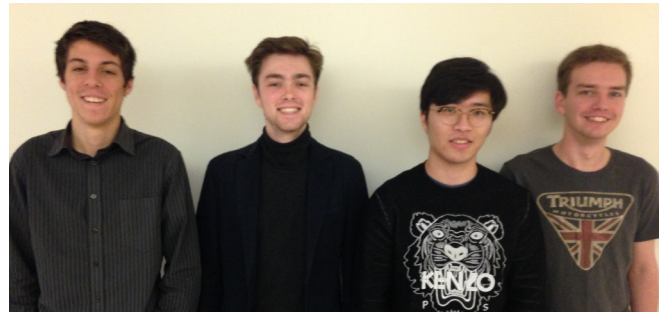
CLASS COMMENTS:
This course gives us an early experience for how to work as a real engineer.

Bluetooth Interface Software for Off the Shelf OBDII Bluetooth Dongle

General Motors & VTTI

Challenge:

Select an OBD- II adapter, and develop API for selected adapter on both Linux and Android platforms.

Alexander LePelch, Alexander DeRieux, Shengsheng Yuan, John Bialick

ALEXANDER LEPELCH

CENTREVILLE, VA

Electrical engineering, interest in embedded systems and electromagnetism.

ASPIRATIONS:

Design and develop; embedded systems and testing architectures for space and transportation industries. Conduct research on electromagnetic systems.

CLASS COMMENT:

This course forces one to think critically and make decisions based on engineering knowledge and analysis. It also teaches that teamwork in engineering is a must for project completion.

ALEXANDER DERIEUX

KING GEORGE, VA

Electrical Engineering and Computer Science, interested in communications, mobile application development, software design, human- computer interaction, and creative design.

ASPIRATIONS:

Learn, develop, design, and serve as a scientist and engineer.

CLASS COMMENT:

This capstone is an amazing opportunity to learn about industry-level project management, teamwork, and apply knowledge gained throughout a four-year college career.

SHENGSHENG YUAN

BLACKSBURG, VA

Electrical Engineering, interest in Power Electronics and Nanotechnology.

ASPIRATIONS:

Develop skills on research, design, and communication. Pursue a Ph.D. degree in Nanotechnology.

CLASS COMMENT:

It is a good project, and this class is an opportunity to learn some real-world industry experience.

JOHN BIALICK

CLARKSVILLE, MD

Computer Engineering.

ASPIRATIONS:

Embedded systems programming at General Motors. Pursue a graduate degree in management and advance to a management position

CLASS COMMENT:

It is quite refreshing to be given a project and have the full creative liberty to approach it from any angle.

Develop Low Rate Under Communications Capability

INMARSAT

Challenge:

Design a M2M satellite communication link with the constraints of not interfering with primary traffic and using low power. Trade-offs to be considered include different modulation schemes, coding types, and spreading types as well as different hardware options for a design.

Omar Alakwaa, Kaitlin McCarthy, Jake Koenig, Ben Wengert

OMAR ALAKWAA

SANA'A, YEMEN

Electrical Engineering, minor in math, interest in satellite communication and integrated circuit design.

ASPIRATIONS:
Earn an MBA while expanding both of my hardware and software skills.

CLASS COMMENT:
In short, this class defined what a hand on experience truly is. It allowed me to gain insight on how the industry, research and academia work together. It was an invaluable real-world experience that provided me with an amazing opportunity to develop business, professional, and technical skills.

KAITLIN MCCARTHY

PITTSBURGH, PA

Electrical Engineering, interest in communications and radar systems.

ASPIRATIONS:
Work as a testing or design engineer in the field of satellite communication systems at a government or government contracting company and work up towards managerial positions within the company.

CLASS COMMENT:
This capstone project provided a different experience outside of a typical class by creating an engineering job-like environment of working on a team project under a manager.

JAKE KOENIG

LEESBURG, VA

Electrical Engineering, interest in communications and circuit design.

ASPIRATIONS:
Work as an electrical engineer, preferably in the aerospace or communications industries. Over the course of many years, work up to management within a company.

CLASS COMMENT:
This class provided a great mix of technical and professional skills. It also gave our team experience with how to be efficient and effective as a group while we transition into our careers.

BEN WENGERT

ARLINGTON, VA

Electrical Engineering with a focus in RF and Radio Engineering.

ASPIRATIONS:
Work in industry especially with RF as I see it as the "black magic" of the electrical engineering. RF is projected to have good job security and high salary especially with the introduction of the Internet of things movement. I also hope to eventually get a Masters in EE whether directly after graduation, or be part of sponsorship with a company.

CLASS COMMENT:
This class provided helpful interactions with a company in industry along with the many challenges, intricacies, and frustrations associated with that. In the end these are all valuable experiences for the students and help the students grow professionally.

Resistive Switching Memory and Reliability

Intel Corp.

Challenge:

Fabrication of Metal Devices and Testing of Intel samples for Time Dependent Dielectric Breakdown (TDDB). This would include a demonstration of successful resistive switching (RS) device operation for fabrication. And a final report of all RS and TDDB characterization with a summary of which devices exhibited best TDDB and RS behavior.

YE FAN

CHENGDU, CHINA.

I expect to achieve my PhD degree in electrical engineering in 2019.

ASPIRATIONS:

I want to be a product quality and reliability engineer in a semiconductor company after graduation.

CLASS COMMENT: During two semesters senior design class study, I gained lots of device fabrication and testing skills in the cleanroom. I also learn how to work with teammates and customers effectively. I really enjoyed this class so much.

TASSBIEH HASSAN

BURKE, VA USA

I am expected to receive a Bachelor of Science in Electrical Engineering in the spring of 2016.

ASPIRATIONS:

I am going to be a development engineer for IBM in Burlington, Vermont.

CLASS COMMENT:

This class has really opened my eyes to what it will be like working in the real world, working with customers, working in a team, and delivering a final product in the end. I have enjoyed this class very much and hope other students continue to succeed in it.
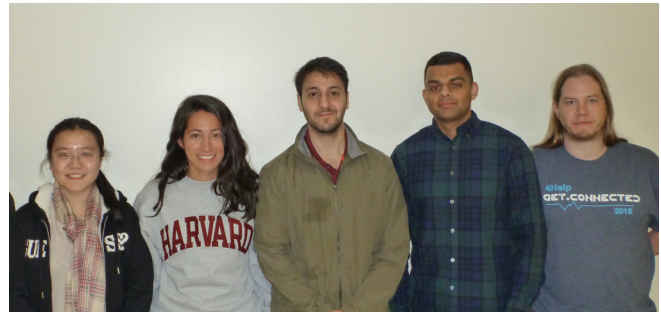
SARDAR HAMZA NAQI

LAHORE, PAKISTAN.

I expect to earn my Bachelor's degree in Electrical Engineering in May 2016.

ASPIRATIONS:

I aspire to build a career in microelectronics and semiconductor processing.

Ye Fan, Tassbieh Hassan, Sardar Hamza Naqi, Momin Haq, Kenneth Berry III

CLASS COMMENT:

This course has really helped me get a better understanding of how a big company like Intel operates on a daily basis. The expectations and realizations from working in this setting has been a huge learning curve.

MOMIN HAQ

ALEXANDRIA, VA

I expect to earn my bachelor's in electrical engineering this May.

ASPIRATIONS:

I want to start work in the home automation industry for a while and eventually start my own company

CLASS COMMENT:

This class has allowed us to experience before graduation, what we will learn after we start working for a company for a few years, and that gives us a competitive advantage over other candidates applying for jobs.

KENNETH BERRY III

FREDERICKSBURG, VA

I expect to earn my bachelor's in Computer Engineering in May 2017.

ASPIRATIONS:

I enjoy the design and theory behind Virtual and Augmented reality and hope to work in this field upon graduating.
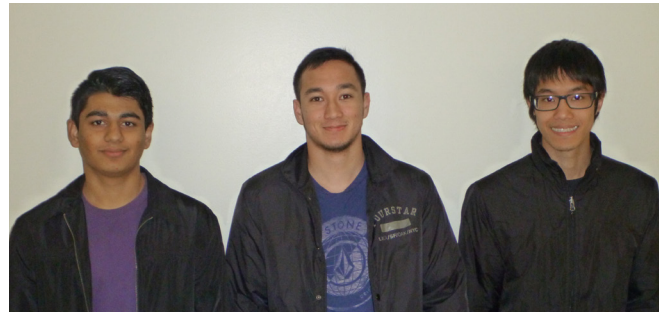
CLASS COMMENT:

This class has given me the chance to gain good group collaboration experience. It has also allowed me to gain first hand experience fabricating devices and insight into the testing process for designing these devices. This information will give me a great head start when I join the job force in a year.

Develop a Satellite Telephony Modem Auto-dialer System

Iridium Communications

Challenge:

Utilize the BeagleBone Black to interface with Iridium's modem to record and playback glitchless bit-accurate audio files, and as well as allow playback to subscribers through a message broker.

Jenil Patel, Sean Morse, Daniel Nguyen

JENIL PATEL

FAIRFAX, VA
Computer Engineering, B.S.

ASPIRATIONS:
I hope to make an impact on the way this world is evolving.

CLASS COMMENT:
This class changed the way I will approach developing my skills in the workspace as my career begins. It was very beneficial in terms of what I learned technically as well as it was socially in a team environment.

SEAN MORSE

CHESAPEAKE, VA
Computer Engineering, B.S.

ASPIRATIONS:
Make everyday life easier for people through engineering.

CLASS COMMENT:
This class showed me the importance of the non-technical skills involved in the industry such as communication and leadership.

DANIEL NGUYEN

CHANTILLY, VA
Electrical Engineering, B.S.

ASPIRATIONS:
To be the forefront of future technology development that would benefit society as a whole.

CLASS COMMENT:
This class taught me a valuable lesson on how the industry functions. The class allowed me to gain industry experience through professional development and business skills along with some technical practices.

Wireless Clock Synchronization for Distributed RF Systems

Johns Hopkins Applied Physics Lab

Challenge:

Design and experimentally demonstrate an approach for synchronizing the on-board clocks on distributed RF systems for a self-organizing RF transmitter.

Andrew Rosenberger, Ilya Ivanov, Rich Dumene

ANDREW ROSENBERGER

FAIRFAX, VA

BSEE

ASPIRATIONS:
Seek a career working on radio systems with a company in the defense industry.

CLASS COMMENT:
This class combines academic experience with project management requirements which fosters the transition from classwork to industry work.

ILYA IVANOV

BLACKSBURG, VA

BSEE

ASPIRATIONS:
Pursue a career in the space industry and contribute to/ be a part of the growth of the industry

CLASS COMMENT:
Learn the ropes of a real engineering project from start to finish with emphasis on both the technical and management aspects.

RICH DUMENE

LEESBURG, VA

BSEE

ASPIRATIONS:
Enter the accelerated masters program at Virginia Tech and commence working full time at Texas Instruments in the summer of 2018.

CLASS COMMENT:
While a fantastic concept for a course 4805/4806 still could use some work to make it truly great. No other course has the same potential to bridge academic and industry experience in the same way.

UAS Meteorological Sensor

Johns Hopkins Applied Physics Lab

Challenge:

Develop and evaluate a low-cost system using a Commercial-Off-The-Shelf UAS and attached sensor package to collect meteorological readings in the lower troposphere. The system should help to increase the frequency of meteorological readings while avoiding data contaminating effects.
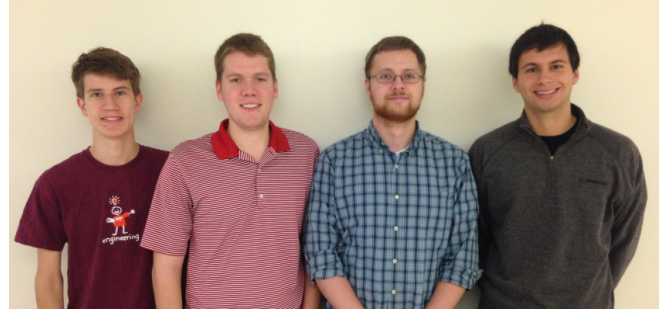
Matthew Fontaine, Eric Petrosky, William Gerhard, Garrett Rosich

GARRETT ROSICH

ACTON, MA

Electrical Engineering, interest in hardware electronics and electromagnetics.

ASPIRATIONS:
Pursuing a Master of Science in Electrical Engineering at Virginia Tech researching a CubeSat mission. Then contribute as an electrical or systems engineer at an aerospace or defense company. Eventually advance to a leadership or managerial role.

CLASS COMMENT:
This class provided real work experience on how to solve industrial problems beyond technical issues. Also, it provided a valuable teamwork and leadership experience.

ERIC PETROSKY

CROFTON, MD

Electrical Engineering, interest in satellite systems and space communications.

ASPIRATIONS:
Complete Master of Science degree in electrical engineering as a Graduate Research Assistant with the Hume Center for National Security and Technology at Virginia Tech. After graduation, contribute to a company in the space, defense, or aerospace industry.

CLASS COMMENT:
This course is as close to real industry experience as academia can be, dealing not only with technical issues but administrative topics and program management as well.

WILLIAM GERHARD

WOODBRIDGE, VA

Electrical Engineering, interest in embedded systems and control systems.

ASPIRATIONS:
Work professionally in the field of unmanned/autonomous systems.

CLASS COMMENT:
This class presents a more realistic look at engineering outside of what is normally covered in academia.

MATTHEW FONTAINE

PASADENA, MD

Electrical Engineering, interest in control systems.

ASPIRATIONS:
Start working for a company in the field of control systems and machine learning. While working I also plan to take classes to get my Master of Science in Electrical Engineering

CLASS COMMENT:
This course required the team to solve problems and complete a project that is more similar to real world engineering than standard class projects.

IC Building Blocks, Design, Simulation

Lockheed Martin

Challenge:

Design and simulate a Low Noise Amplifier to operate in the Bluetooth RF frequency band. Create IC layout of LNA suitable for manufacture by foundry process.
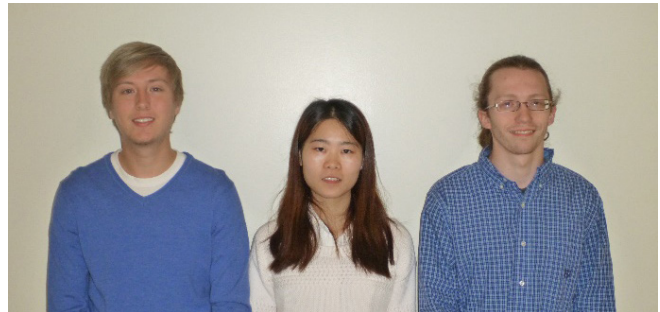
Jason Eller, Yingying Gui, Daniel Hall

JASON ELLER

STERLING, VA

Electrical Engineering, interested in signal processing, communications networks, and sensor technology.

ASPIRATIONS:
To work in an engineering lab focused on communications/networking and the incorporation of Internet of Things devices. Eventually, I would like to work towards becoming a Project Manager.

CLASS COMMENT:
The class provides a great platform for improving teamwork and communication skills. While the technical knowledge gained has been significant, it was my teamwork and ability to communicate with team members, the subject matter expert, and the customer which were really tested.

YINGYING GUI

WUHAN, CHINA

Electrical engineering, interested in circuit design.

ASPIRATIONS:
Pursue a graduate degree in power electronics. Contribute as a hardware engineer in industry.

CLASS COMMENT:
This class provide a great opportunity to learn the spirit of teamwork and real-life working experience.

DANIEL HALL

HARRISONBURG, VA

Electrical Engineering, interested in hardware design, signal analysis, and antenna design.

ASPIRATIONS:
To become a skilled electrical engineer in hardware design and analysis, so that I may work for and become an asset to Lockheed Martin.

CLASS COMMENT:
This class is more than lecture, it is a fantastic approach at blending technical skills, professionalism, and communication skills in a business environment to leave a real world impression on the students.

Asymmetric Material Design Analog Circuit

Lockheed Martin

Challenge:

Asymmetric electronic materials are alternatives to modern electronics. As additive manufacturing technologies advance, alternative materials become more viable. The purpose of this project is to research, design, and prototype designs for analog circuit elements made of non-traditional materials.
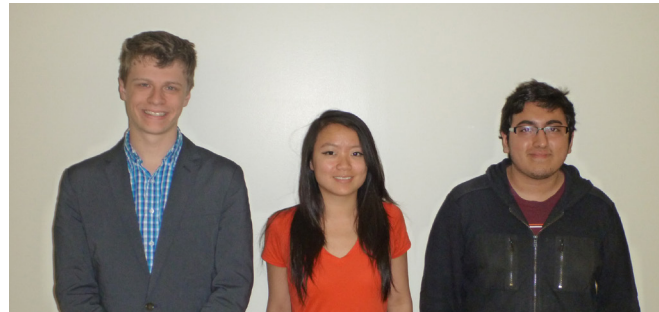
William Cowen, Linda Li, Ahmed Parvez

WILLIAM COWEN

ARLINGTON, VIRGINIA

Electrical & Computer Engineering Senior.
A senior majoring in Electrical and Computer Engineering at Virginia Tech. He has many years of experience programming in C++. He currently holds a position in research and development at a local Blacksburg biometrics company.

ASPIRATIONS:
He aspires to pursue his research interests in graduate school and beyond.

CLASS COMMENT:
This class really showed me just how much room for improvement I had in critical areas such as team building, self driven projects, and presentation skills. Gino's lectures and meetings helped me improve those skills.

AHMED PARVEZ

BOYDS, MARYLAND

Electrical Engineering Senior.
A senior soon to be graduating with a degree in Electrical Engineering.

ASPIRATIONS:
To advance his career in the field of integrated circuit design and microelectronics.

CLASS COMMENT:
This course was a great opportunity for me to get a taste of industry life in a professional setting. It also provided me with the ability to prioritize tasks and take initiative when facing practical problems.

LINDA LI

CHANTILLY, VIRGINIA

Electrical Engineering Senior.
A senior pursuing a degree in Electrical Engineering.

ASPIRATIONS:
Out of college, Linda intends to gain more experience in Big Data and Internet of Things. A long term goal of hers is to create a product that benefits others.
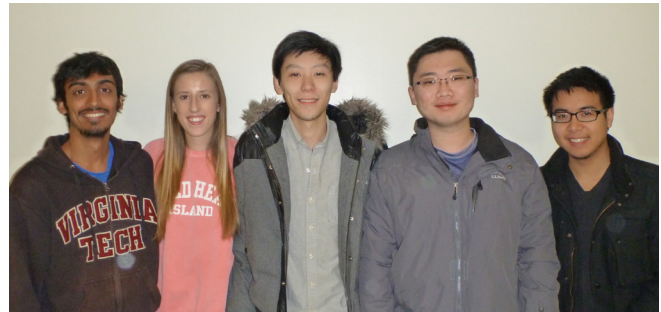
CLASS COMMENT:
I think the class is great. It offers development in areas that aren't focused on in most of our classes and I really enjoy that.

FPGA-Based Switch Circuits

Lockheed Martin

Challenge:

Develop a Beneš-Clos switch networks of sizes 8, 16, and 32 on an FPGA. Test those networks and compare the theoretical and empirical results.

Harsh Sharma, Alexandra Makar, Yibo Xu, Yihan Pang, Jenfrey Van

ALEXANDRA MAKAR

REISTERSTOWN, MD
Computer Engineering, Senior.

ASPIRATIONS:
Contribute as a hardware design engineer. Pursue a graduate degree in business.

CLASS COMMENT:
This class provided the opportunity to develop professional skills along with our technical skills.

YIBO XU

SHANGHAI, CHINA
Computer Engineering, Graduated.

ASPIRATIONS:
Pursue a graduate degree in Computer Science, and contribute as a product engineer in a tech company.

CLASS COMMENT:
We learned leadership skills as well as project management skills.

YIHAN PANG

BEIJING, CHINA
Computer Engineering, Graduated.

ASPIRATIONS:
Pursue a graduate degree in CPE. Contribute as an embedded system engineer and advance to a position in government.

CLASS COMMENT:
This class provided the opportunity to experience working in industry so that students are better prepared for challenges ahead.

JENFREY VAN

CENTREVILLE, VA
Electrical Engineering, Senior.

ASPIRATIONS:
Contribute as an electrical engineer to bring innovation and competitive advantage to effect.

CLASS COMMENT:
This class allowed the students to experience the life of working in industries and brings out their project management skills.

HARSH SHARMA

NEW DELHI, INDIA
Computer Engineering, Senior.

ASPIRATIONS:
Contribute as a software engineer in a challenging position and advance to a managerial role.

CLASS COMMENT:
The class provides an incredible opportunity to get real world experience while still in school.

Developing Dry Etching Processes for 2D Materials

Micron Technology

Challenge:

Successfully transfer graphene onto a silicon substrate. Pattern and etch different designs onto the graphene samples. Examine and improve upon the process to achieve better quality of graphene.

Ajaypal Randhawa, Arshiya Gupta, Ryan Baker, Mikhail Wolff

AJAYPAL RANDHAWA

HERNDON, VA

Electrical Engineering. Interest in semiconductors, RF and power electronics.

ASPIRATIONS:
Contribute as a power electronics engineer for a company working with renewable energy.

CLASS COMMENT:
The best part of this class was that it exposed me to real life work where you get to interact with the customer.

RYAN BAKER

STANLEY, VA

Electrical Engineering. Interest in power and electronics.

ASPIRATIONS:
Contribute as a project manager and skilled engineer at M.C. Dean. Obtain a bachelors degree in electrical engineering.

CLASS COMMENT:
The class provides great leadership responsibilities and team building in a real life work environment.

MIKHAIL WOLFF

FOREST HILL, MD

Electrical Engineering with interests in holography and embedded systems.

ASPIRATIONS:
Contribute to new technologies advancing 3-D visualization of media and information, and creating holographic displays.

CLASS COMMENT:
We learned many soft skills not focused on in other environments. Our specific project gave me an experience that may not be in the specific field that I want to enter, but it gave me a deeper appreciation for the hard work that goes into creating electronics from the most basic level.

ARSHIYA GUPTA

LORTON, VA

Electrical Engineering with an interest in power and electronics.

ASPIRATIONS:
Contribute as a power electronics engineer, eventually become a project manager.

CLASS COMMENT:
This class provides real world experience where we got to interact with the customer as well as obtain great leadership skills.

Antireflection Coating for Photovoltaics

Micron Technology

Challenge:

To develop an innovative dielectric coating able to absorb at least 90% of light across the broadband wavelength range between 400 nm and 1000 nm.

Tianfang Liu, Jahin Habib, Sharon Ferracci, Ryan Potter

JAHIN HABIB

VIENNA, VA

Electrical Engineering, interest in RF engineering and vehicular telecommunications.

ASPIRATIONS:
Pursue graduate studies in the electromagnetics field.

CLASS COMMENT:
Invaluable experience working in a team environment while satisfying customer needs.

SHARON FERRACCI

SUFFOLK, VA

Computer Engineering, minor in Mathematics.

ASPIRATIONS:
Work on a team developing innovative defense software or working in cybersecurity.

CLASS COMMENT:
This course is unlike any other I've come across in my four years at VT, providing students not only with hands-on team experience in a real-world project of their own choosing, but also with professional interactions and networking possibilities with working engineers in the field.

TIANFANG LIU

CHINA

Electrical Engineering, focus on VLSI circuits and Systems.

ASPIRATIONS:
Go to graduate school to improve my knowledge in VLSI circuits and systems.

CLASS COMMENT:
Working on a team and solving real world problems for real customers has extremely improved our practical technics and experiences. The most helpful class I have ever taken in my college life!

RYAN POTTER

LAUREL, MD

Electrical Engineering.

ASPIRATIONS:
Work with power and control systems. Continue challenging myself professionally and as an individual.

CLASS COMMENT:
As graduating seniors, working for a customer gives us invaluable professional experience. This class provides the opportunity for each individual grow as part of a team and provide solutions to technologically advanced problems.

Realtime Mosaicking with Snapdragon - Hokie Vision

Qualcomm

Challenge:

Develop an image processing application on the Qualcomm DragonBoard 410c. The application can, in real time, stitch together adjacent frames from a video stream to build a single mosaicked image of the flight area. With this application a user can identify areas of interest, such as broken fences, or areas of poor irrigation.
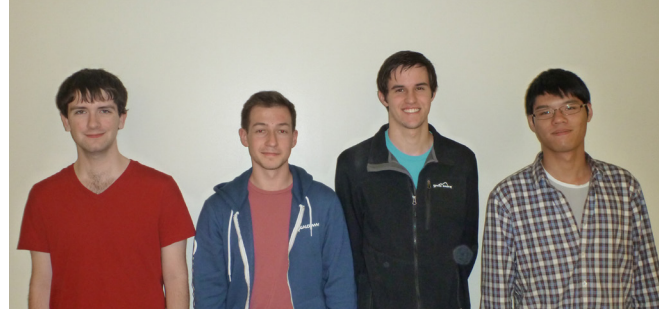
Bryant Sweet, James Elliott, Mitchell Sturtz, Zhenjie Chu

BRYANT SWEET

NEWPORT NEWS, VA

Computer Engineering with interest in software design and embedded systems.

ASPIRATIONS:
Contribute as an embedded system designer for prosthetic devices to help those who have experienced life changing injuries and disabilities.

CLASS COMMENTS:
This class has been a wonderful opportunity to receive the chance to experience what it is like in the real world, and to be able to see what this industry has to offer.

JAMES ELLIOTT

ROANOKE, VA

Computer Engineering with interest in software development.

ASPIRATIONS:
Contribute as a software engineer to high level projects, specifically ones that have impact on a global scale.

CLASS COMMENTS:
This class has significantly improved my ability to work in teams and has shown me the benefit of creating and adhering to a detailed schedule.

MITCHELL STURTZ

WESTMINSTER, MD

Electrical Engineering with interest in communications and signal processing.

ASPIRATIONS:
Contribute as an electrical engineer for advancements in public safety mobile broadband networks and devices.

CLASS COMMENTS:
This class has presented an opportunity to work on a technical project with real world issues.

ZHENJIE CHU

HUZHOU, CHINA

Electrical Engineering with an interest in electrical components, circuits, systems, and embedded systems.

ASPIRATIONS:
Contribute as an electrical engineer and software designer. Pursue a graduate degree in electrical/computer engineering and advance as a skilled hardware and software engineer.
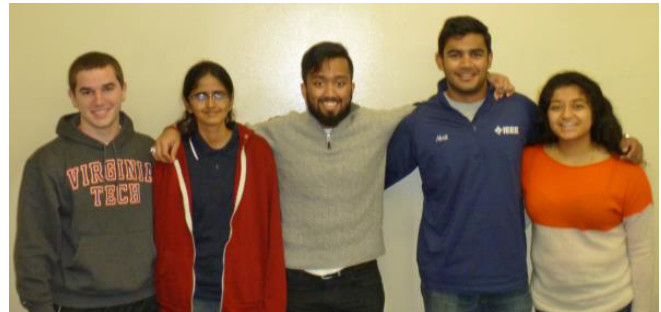
CLASS COMMENTS:
This class provides an awesome opportunity to familiarize with real-world project management and teamwork situations.

Realtime Mosaicking with Snapdragon - SnapVision

Qualcomm

Challenge:

Our challenge was to develop a real-time video mosaicking application that runs on Qualcomm's Snapdragon™ SOC development board.

Kyle Imhof, Sushma Burujupalli, Zawad Chowdhury, Akrit Mohapatra, Ria Sarkar

KYLE IMHOF

YORKTOWN, VA
Computer Engineering.

ASPIRATIONS:
I aspire to become an excellent software developer, with the knowledge to integrate many types of hardware. I ultimately want to run my own business with a focus on unmanned vehicles for a wide range of customers and applications.

CLASS COMMENT:
This course has given me perspective on the business aspect of a technological field. I have learned how to manage time spent on a project and work with a team, subject matter expert, and customer to develop an excellent final product that is worth the time spent on its creation.

SUSHMA BURUJUPALLI

HYDERABAD, INDIA
Computer Engineering.

ASPIRATIONS:
I aspire to become a good Engineer and to make a difference. Establish a start-up.

CLASS COMMENT:
Working with a customer, as a team and meeting the required deadlines is a great learning experience to have before actually facing the challenges of working at an Organization. Guest lectures were informative.

ZAWAD CHOWDHURY

STERLING, VA
Computer Engineering.

ASPIRATIONS:
I aspire to use my expertise to help others.

CLASS COMMENT:
This class has truly been a learning experience, it was my first time working with a Customer and Subject Matter expert. Being able to manage a yearlong capstone project and properly engage the different point of contact are just a couple skills I picked up.

AKRIT MOHAPATRA

MUSCAT, OMAN
Computer Engineering.

ASPIRATIONS:
I aspire to gain a graduate degree in computer engineering and pursue research in machine learning and computer vision and make advancements that could potentially help humans.

CLASS COMMENT:
This class was a great experience providing me with the opportunity to work on a real world project and improve upon my skills.

RIA SARKAR

CHANTILLY, VA
Computer Engineering.

ASPIRATIONS:
I aspire to invent the future by teaching the next generation everything I have to offer.

CLASS COMMENT:
This class provided a lot of great insights into what I could expect from a career in the real world. Unlike an internship where you usually work with people who have many more years of experience than yourself, this required working with my peers who had the same level of experience as I did.

802.15.4 Wireless Packet Capture Device

United Technologies

Challenge:

Develop and demonstrate a low cost USB based IEEE 802.15.4 packet capture device. The device and associated software should be capable of operating for multiple days without an error that causes the software or hardware to be restarted. This device will interface with the WireShark network protocol analyzer software.

Brock Allen, David Abbott, Neil Yavorski, Adam Kraimeche, Siraj Ali

BROCK ALLEN

VIRGINIA BEACH, VA

B.S. Computer Engineering.

ASPIRATIONS:
Working with computer sound synthesis and interaction in order to augment music and how it can be created.

CLASS COMMENT:
This class sheds light on what industry is and how it operates through contracts. It gives insight on many aspects of business that a traditional engineering class would not.

DAVID ABBOTT

BERWYN, PA

Electrical Engineering, Bachelors of Science.

ASPIRATIONS:
Contribute as a systems engineer at Cisco Systems in technical sales dealing with networking, IoT, and cloud solutions. Eventually become a sales manager for large scale networking applications.

CLASS COMMENT:
This course has allowed us authentic customer interaction that no classroom setting could ever provide. The leadership and team experience is invaluable.
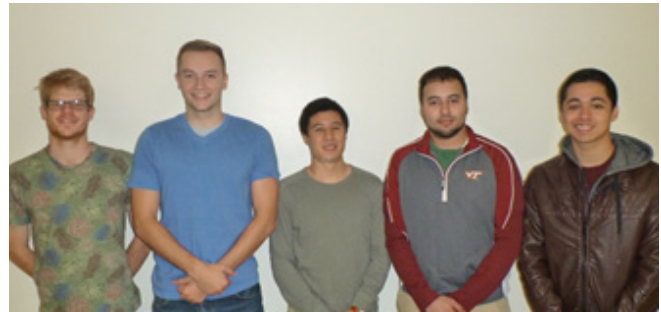
NEIL YAVORSKI

SPRINGFIELD, VA

Computer Engineering, interest in software development and networking.

ASPIRATIONS:
Advancing my skills in software development. Contributing to large scale projects and working with internet enabled applications.

CLASS COMMENT:
This class exposed me to working and accommodating a customer's requests for work. Valuable communication and leadership skills were also emphasized.

ADAM KRAIMECHE

HARRISONBURG, VA

Electrical Engineering, Bachelors of Science.

ASPIRATIONS:
Contribute as a data network engineer to help provide for the growing demand of telecommunications. I aspire to pursue postgraduate studies in business administration or start a business of my own.

CLASS COMMENT:
This course encompasses a wide spectrum of non-academic benefits for students; having the opportunity to explore real world problems, interact with customers, and take leadership roles are to name a few.

SIRAJ ALI

GAINESVILLE, VA

Computer Engineering, interest in software development, cyber security, and networking.

ASPIRATIONS:
Contribute as a software engineer at Capital One Financial Corporation. Advance my knowledge and skills in software design and implementation, as well as cyber security. Pursue a graduate degree in CS or CpE.

CLASS COMMENT:
This class provided me with industry-like experience and honed my skills in teamwork, leadership, and customer interaction.

4.2–4.4 GHz Wireless Communication

United Technologies

Challenge:

Produce a study of techniques to detect and mitigate interference in the 4.2-4.4 GHz spectrum between radio altimeters and Wireless Avionics Intra-Communication sensors. This can potentially lead to lighter aircraft with the removal of cabling previously used with wired sensors.

Ehsaan Pakmehr, Jordan Smith, Xiaofan Yang

XIAOFAN YANG

CHINA

Electrical Engineering. Interest in wireless communication.

ASPIRATIONS:

Contribute as a communication engineer and advance to a technical management position.

CLASS COMMENT:

This class provides wonderful opportunity to get hands-on experience and deal with real-world problems.

EHSAAN PAKMEHR

VIENNA, VA

Computer Engineering. Interest in large scale information networking.

ASPIRATIONS:

Work in the information technology industry for a couple of years. Continue to do contracting and consulting. Open my own restaurant.

CLASS COMMENT:

This class taught valuable lessons when it came to project management, customer relations, and overall business processes. A "must take" for students of all demographics.

JORDAN SMITH

CENTREVILLE, VA

Electrical Engineering. Interest in Satellite communications and telecommunications.

ASPIRATIONS:

Contribute as an electrical engineer to the satellite communications or telecommunications community. Advance my career into management.

CLASS COMMENT:

This class provides an experince unlike any other offered at Virigina Tech. It gives genuine involvement between students, companies, and professors to work out a real life problem.

Additive Manufacturing of Magnetic Components

United Technologies

Challenge:

To additively manufacture a transformer that will be used in a circuit to light up an LED.

Elizabeth Nerdig, David Garcia, Nathan Woods, Sulman Khan, Dounan Li, and Dana Kazerooni

ELIZABETH NERDIG

PRINCE GEORGE, VIRGINIA

Bachelors of Science in Materials Science and Engineering.

ASPIRATIONS: I aspire to work as a material science engineer in application to electronic materials.

CLASS COMMENT: The best part of this class is having the opportunity to collaborate with real companies working on cutting edge projects. This is more than just a group project with an end goal of achieving an A; the goal of this class is to have us get real, valuable experience working in an environment similar to what most of us will be working in right after graduation.

DAVID GARCIA

ALEXANDRIA, VIRGINIA

Bachelors of Science in Materials Science and Engineering.

ASPIRATIONS: I plan on continuing my academic career in graduate school.

CLASS COMMENT: This capstone class has been a fantastic opportunity to interact with a variety of people in a professional context. We constantly have to communicate with our teammates, our corporate sponsor, product vendors, and university administrators.
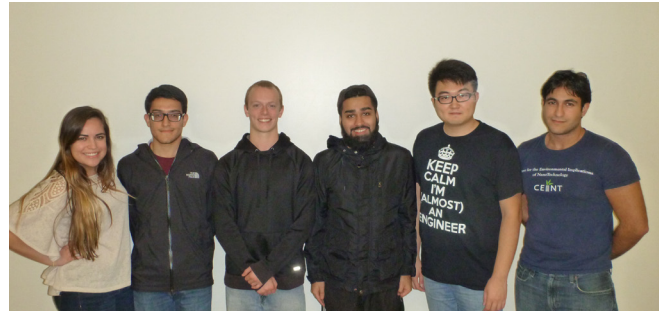
NATHAN WOODS

RICHMOND, VIRGINIA

Bachelors of Science in Electrical Engineering.

ASPIRATIONS: I will be working as an RF engineer for an internet service provider in Richmond, VA.

CLASS COMMENT: This class has significantly changed my view of how research is conducted. I had always heard that technology has progressed to the point that any new designs have to come from a team effort, but it is something else entirely to actually see this in practice. During this project, I have spent less time in the lab than I expected, and much more time tracking down and talking to various experts about a particular piece of our puzzle. The interesting part for me has been when the team takes all these bits of information and figures out how to combine them to make something entirely new.

SULMAN KHAN

BROOKLYN, NEW YORK

Bachelors of Science in Materials Science and Engineering.

ASPIRATIONS: I am hoping to apply my knowledge of materials science and engineering to design and build chipsets by leading cutting-edge teams.

CLASS COMMENT: The senior design capstone class has allowed me to develop a profound relationship with both a private company and an academic professor. Not only do I gain insight on how to operate in a team environment, but I partake in weekly meetings with a subject matter expert or company representatives. The most important concept I learned from this project was change – project goals and deliverables are subject to change, but it is your job to modify those certain requirements to get the project completed and your customer satisfied.

DOUNAN LI

SHENYANG, CHINA

Bachelors of Science in Electrical Engineering.

ASPIRATIONS: I will be working as an electrical engineer in the field of signal Processing or power electronics.

CLASS COMMENT: This senior design class gives me lots of hands-on experience and interdisciplinary team work experience that I never had before. It gives me a concept of what dose a professional engineer looks like when dealing with customers, I think this course is exceedingly helpful for those fresh graduates of adapting their future career.

DANA KAZEROONI

MCLEAN, VIRGINIA

Bachelors of Science in Materials Science and Engineering.

ASPIRATIONS: I hope to start my own company eventually in designing and optimizing the next efficient high performance vehicle.

CLASS COMMENT: The capstone project allowed me to explore and interact with corporate employers which is different from the past four years of academic and fundamental research that I have been introduced to. It has allowed me to observe and study the relationship dynamics between employer and employee which I will use in designing my own company someday.

ECE Inventory Control System

Virginia Tech ECE

Challenge:

Develop a mobile application to control the inventory owned by the ECE department. We hope to reduce the various current issues faced by the department. The app will allow an authorized user to add, maintain and view the different items in the inventory.

Ning Li, Ramchandra Pai, Anusha Pillai, Jiewen Hu, Peng Lu, Dong Nan

ANUSHA PILLAI

MUMBAI, INDIA

Computer Engineering, Computer & Software Systems.

ASPIRATIONS:
To learn, contribute and grow as a full stack developer.

CLASS COMMENT:
This class provides us with a huge amount of training to help one smoothly transition from school to corporate world.

DONG NAN

BEIJING, CHINA

Computer Engineering, Software Systems & Machine Intelligence.

ASPIRATIONS:
Contribute as a software developer.

CLASS COMMENT:
Learned to be professional and experienced hands-on project as in industry from this class.

JIEWEN HU

GUANGZHO, CHINA

Electrical Engineering.
Power Electronics

ASPIRATIONS:
To be a hardware engineer.

CLASS COMMENT:
This class helps me enrich my knowledge of software and gives me some corporate experience.

NING LI

X'IAN, CHINA

Computer Engineering.

ASPIRATIONS:
Build awesome software.

CLASS COMMENT:
The best part of this class is to build something from scratch, to keep learning and keep solving real world problems.

PENG LU

HUBEI, CHINA

Electrical Engineering, Software Systems & Machine Intelligence.

ASPIRATIONS:
Interested in coding and algorithms.

CLASS COMMENT:
Gain both knowledge and experience in software development; have basic understanding on how things work in industry. The biggest challenge is to learn knowledge I am not familiar with.

RAMCHANDRA PAI

MANGLORE, INDIA

Computer Engineering
Software Systems.

ASPIRATIONS:
Gain end to end knowledge in computing systems to help me be a better systems engineer.

CLASS COMMENT:
Class taught me how to function better in a team and be a better team leader. The class also helped me build a network which is helping me with job search.

Develop Mobile Single Sign-on Solution

Virginia Tech IT

Challenge:

In many situations a user may need to individually sign on for multiple applications that require the same credentials of the same domain. We aim to develop a system that enables a User to login to multiple applications within the same domain by only submitting their credentials once. We call it the Native Single Sign-On Mobile Solution.

Shobal Attupurath, Steve Briceno, Shobek Attupurath, Brian Kaplan

BRIAN KAPLAN

BURKE, VA

Computer Engineering, Minor in Computer Science. Focus on Software Engineering and Development.

ASPIRATIONS:

Become a masterful Software Developer with a focus on Mobile Application Development.

CLASS COMMENT:

A wonderful opportunity to learn project management and real-world experience. The environment that was created has helped me grow as a professional.

SHOBAL SAM ATTUPURATH

INDIA

Graduate Computer Engineering Student, Focus on Software Engineering and Development.

ASPIRATIONS:

Become a software engineer and eventually be able to architect large scale applications.

CLASS COMMENT:

The class has helped to me gain skills in project management and to understand how important it is in the real world.

STEVE BRICENO

FAIRFAX, VA

Computer Engineering. Focus on Software Engineering and Development.

ASPIRATIONS:

Become a Software Developer with a focus on either Web Technologies or Mobile Development.

CLASS COMMENT:

A great opportunity to learn project management and real-world experience taken for college credit. It has generally provided good feedback to move forward to the real world experience.

SHOBEK SAM ATTUPURATH

INDIA

Graduate Computer Engineering Student
Focus on Software Engineering and Development.

ASPIRATIONS:

Become an engineer that can provide scalable solutions and become a leader in the software industry.

CLASS COMMENT:

Provided an opportunity to learn and employ skills that are much needed in the corporate world.

Design, Build, Test Personal Locator Beacon Architecture

Zeta Associates and Innovative Computer Engineering (ICE)

Challenge:

To create a personal locator beacon that is capable of transmitting a unique ID and GPS location in near real time. The beacon must also be portable and therefore a size constraint is imposed.
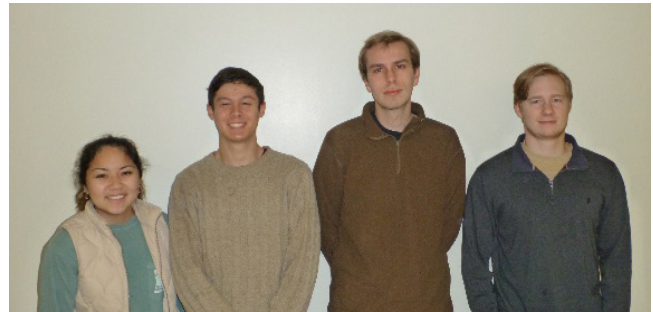
Jackie Duong, Russell Bradley, Wiktor Koczorowski, Devin Utermahlen

JACKIE DUONG

ANNANDALE, VA

B.S. Computer Engineering, minor in Computer Science.

ASPIRATIONS:

After graduation, I'll be a Program Manager at Microsoft. I want to work within product development in the tech industry.

CLASS COMMENT:

Planning and following a project schedule was a new and difficult challenge throughout this course.

WIKTOR KOCZOROWSKI

ASHBURN, VA

B.S. Electrical Engineering.

ASPIRATIONS:

Become an engineer and slowly work my way into becoming a subject matter expert in the fields of communication and electronics/systems.

CLASS COMMENT:

I enjoy the class. I like hands on work and learning as I go. This project has challenged me to not only further my abilities in the areas of electronics but to combine knowledge into forming complete systems.

RUSSELL BRADLEY

ALEXANDRIA, VA

B.S. Electrical Engineering.

ASPIRATIONS:

I love figuring things out and building things. I hope to eventually use my engineering skills to bring critical technology to nations and people groups that lack it, and engineer the future!

CLASS COMMENT:

I thoroughly enjoyed the hands-on design aspect: how I got to take what I learned in past classes and actually implement those concepts into real systems. Working efficiently with a team and keeping with a schedule definitely challenged me, but that ultimately helped me think deeper and be a better team member.

DEVIN UTERMAHLEN

WESTMINSTER, MD

B.S. in Electrical Engineering interested in Communications and Digital Signal Processing.

ASPIRATIONS:

Contribute as a Communications engineer in the Defense or Satellite Industry. Advance as a program manager.

CLASS COMMENT:

This class was a great opportunity to get real world experience while learning how to effectively work as a team.
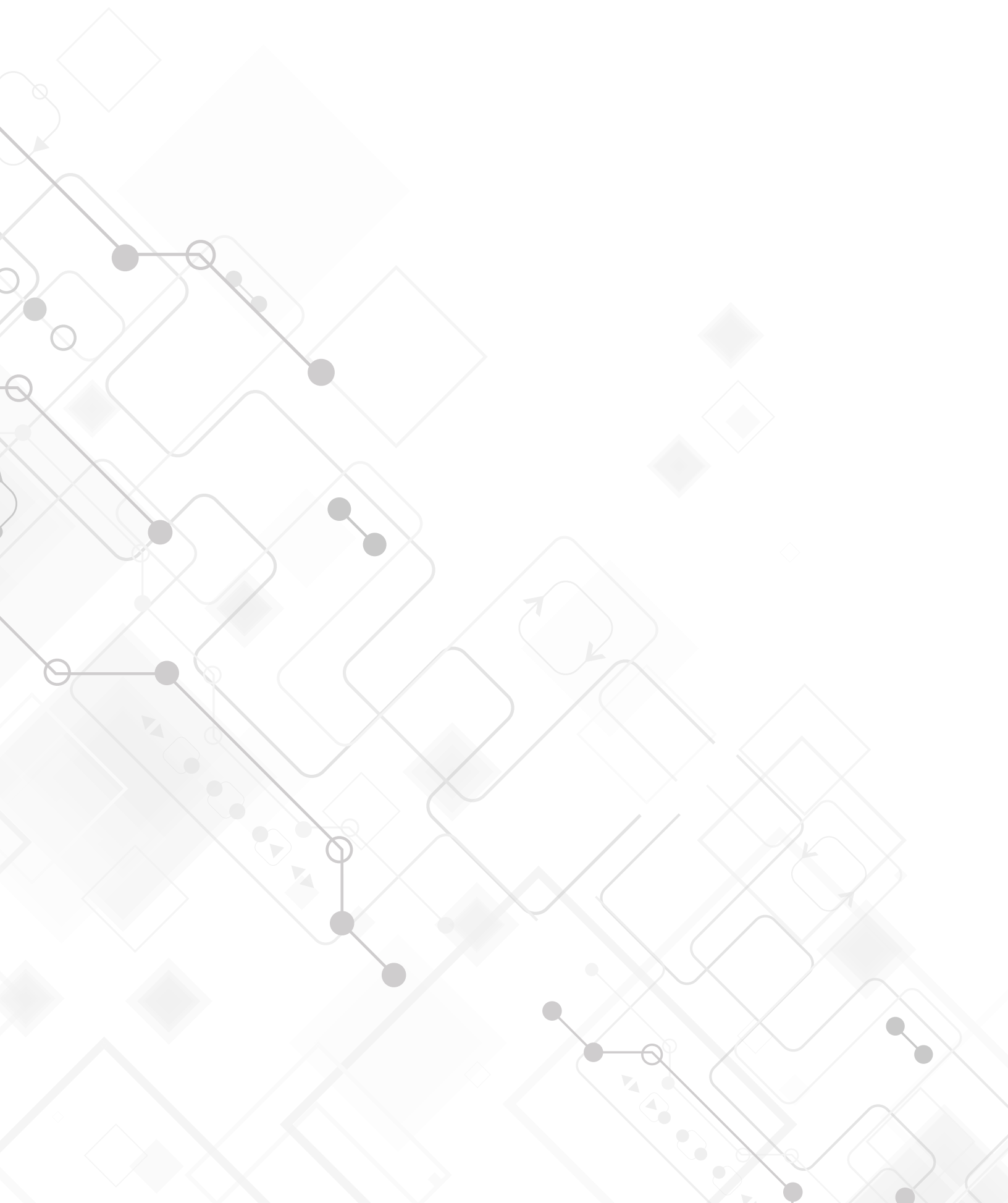
Many people contributed to this program that we want to acknowledge and thank: