Purpose

1. There are various forms of technical communication including paper documents, digital formed papers, web sites, audio and video. Paper documents are used to submit proposals and technical reports to project management and supervisors for hard copy details of work progress and notes. Digital papers are used to communicate through long distances to the project sponsors to communicate within the group, and to keep digital files on record to more easily find information needed throughout the project. Web sites are used to show the public and sponsors information on the team, team members, project description and project updates including completion and results. Audio and video are used to record the project working and presentations on proposals and technical presentations. These are all forms of communication that have been used throughout the semester for the sponsored project. The technical reports that were written were well organized and showed the evolution of the project from day one to the current progress in chronological order with detailed specifications. These reports showed our project facilitator how the team is working together to complete the project in a timely manner with all details covered. The team submitted a proposal for the major design of the project and was approved to work on the project. The proposal covered all the design specifications and why the team chose the design and how it will work. Much material was reviewed in order to fully understand the project and the equipment that will be used to complete the project. These materials were then presented to the class so they can understand what the project consists of and how and why our method and equipment will
complete the project in the most efficient manner. The standards for the project were
given on the first day. The team went through the project outline and made sure everyone
understood these standards to make sure that they were all met successfully. Then the
team went through the applications of the project and made sure they did not conflict
with the standards that needed to be met. While all of this was going on the team was also
looking at the constraints of the project such as cost, size, power, environmental factors,
reliability, safety, maintainability, and reusability. The team made sure all the constraints
were met in the proposal and picked components with longer lifetimes for the project so
the sponsor would know what to expect throughout the project and when the project
should be completed by. The project is to make a more reliable and precise piece of
equipment to measure the coil diameter of steel coils being wound inside a steel plant.
The method has to achieve a better accuracy than the current system and must be
complete by December 5th 2014 and submitted to the sponsor. In today’s world more
companies are more to electrical and computer engineering methods and straying away
from the mechanical predecessors. When used together electrical and computer
engineering provide a more accurate way to measure many different things and compute
closer. The key tools that were used for this project were Matlab and Simulink make a
program to more efficiently compute the diameter of steel coils being wound. Working in
a team maybe difficult due to times when members can meet and the knowledge of each
member in their field. But working in a team when done properly is more efficient,
problems are solved faster, and the knowledge from each member will help with different
aspects of the project. Each member has their roll and are encouraged to help other
members when applicable. Papers were read in order to understand how the hardware and
software would work together with the design tools from the software. The Matlab and Simulink web sites were used for information including some youtube videos of other engineers working on similar projects.

2. Throughout the design process I have learned many different things. I learned that Matlab and Simulink are very powerful tools and that “Smart” cameras can be used for many different applications. My portion for the overall project was to use the edge detection function, to program to recognize and track edges of the Axis Camera video output. This included using different functions and methods together to get the final outcome to track the edges for measurement of the steel coil being wound. These functions included color management to distinguish the edge of the coil from the background of the video. The constraints were to make the measurements within a few percent of the required diameter that needed to be met. This will also be more accurate than the current means of measuring the steel coils at the plant right now. This part was and had to be completed early on in the project to make way to start using the edge detection and tracking to measure the diameter and then optimize the edge detection to get a more accurate measurement. Throughout the semester the code for the edge detection has been being optimized and will continue to be optimized due to lighting changes and reflection of the coil which makes it more difficult to detect the edge of the steel coil.

3. I have helped with all documents that have been submitted and all presentations that have been given this semester. This includes different types of technical communications including paper documents that were submitted, digital papers that were submitted, and audio and video for the presentations that were recorded during class. These documents
included the pre-proposal, proposal, FAST diagram, application note paper, design issues paper, and material for the presentations that were done in class which I was a speaker of.

4. This course has impacted the way I work in a team. It has also helped with my career objectives and professional goals. This has made me a better speaker and researcher when it comes to finding out information on a topic that I am not familiar with. It has also helped me in my presentations that I do for my current research position in the way I speak and answer questions.

5. My strengths are working in a team and being open minded to others ideas and methods. Listening to others also helps you think more creatively so that more ideas come about that can spark into something great in the end. Working in a team helps you understand problems of each part of the project even if it wasn’t your part and helping and getting help from teammates helps the project move forward more quickly with less mistakes. My weaknesses are trying to get everything done at once and not taking the time to make sure outline and design are perfect. I like to rush into things nut being in a team has helped with this.

6. Five years after graduation I would like to see myself have completed my master in power electronics and have a job with Ford Motor Company working on hybrid electric vehicles and fully electric vehicles. I would like to be designing, testing, and optimizing designs to produce a more efficient model.

7. The life-long learning steps I must undertake in order to achieve this five year professional goal are to continue my studies, Graduate with my undergraduate degree
then continue my education in power electronics and receive my masters degree. I must learn to work more efficiently and effectively in a group and by myself. I must trust myself in what I know and how much more knowledge I will learn in the upcoming years doing research and working in a team. I would not be far from my family as they live in the general area where I would be working. I plan to have enough funds in order to purchase anything needed for me to complete these goals and pay bills after moving out of my parents home.
Appendix

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EDUCATION

Michigan State University, Bachelor of Science, Electrical Engineering Expected Dec. 2014


- Relevant Projects: Robotics Project (Team Member and Secretary), Solar Water Heater Project (Design and Experimental Engineer), Bumper Design Project (Coding Manager), SAE Racing Team (Electrical Engineer)

EMPLOYMENT

- Power Electronics and Motor Drives Laboratory, Research Assistant Jan 2014 - Present
  - Contribute to a project focused on developing a solid-state variable capacitor/inductor system based on WBG devices for FACTS. Theoretically prove the concept and show the achievable power density.
  - Analyze and simulate the proposed SSVC/L inverter circuits and develop their power decoupling methods.
  - Build and test SSVC/L inverter with SiC devices to verify simulated results
  - Little Box Challenge (Google), build a 2 kVA DC-AC inverter with a power density exceeding 50 Watts/inch

  - Provide security and guest services to visitors, protect artwork on display, communicate with guests regarding Museum mission, exhibitions and building features

RELEVANT EXPERIENCE

- MSU Baja Team, Lead Chassis/ Ergonomics Mar 2012 - May 2014
  - Lead team of engineers on chassis design, wireless Arduino gauge design, infrared heat sensor design, wiring lights and kill switches, installing electrical components and running diagnostics

- MSU Engineering Design Day, Project Presenter, Baja Team Presenter Apr 29 2011, Apr 27 2012
  - Created winning Solar Water Heater and presented it to the public and Engineering faculty
  - Presented the Baja car to the public and answered questions

TECHNICAL SKILLS

- Software and Systems: proficient in MATLAB/Simulink, Saber, PSPICE/AMS Simulator, Cadence, Xilinx ISE 9.2i, PYTHON, AutoCAD, AutoCAD Architecture, Microsoft Works and Office

AWARDS AND HONORS

- MSU Engineering Design Day, Winning Entry
- Solar water heater selected as winning entry based on thermal capacity, efficiency, productivity and safety

- American Cancer Society: Relay For Life, Most Innovative Fundraiser

  May 2007-May 2010

- Rickshaw design won Most Innovative Fundraiser award all four years it was in use

COMMUNITY INVOLVEMENT

- American Cancer Society: Relay For Life, Team Member and Co-Captain

  May 2007-May 2010

- Raised over $1,500 through participation in Relay For Life