GRANT NICOL, CET, INTET (CANADA)

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SUMMARY

I am a full-time time college instructor in the Communications Engineering Technology Program at Assiniboine Community College (ACC). I have been involved in the development and redevelopment of the program as well as the development of the courses I teach. As well as teaching fulltime, I coordinate and advise on student applied research projects in the form of Capstone learning since 2010 (1 day per week). Since 2015, I have been the Faculty Advisor for the ACC Student Chapter of the Certified Technicians and Technologists Association of Manitoba. I also am the Faculty Advisor for the ACC Student Branch of the Institute of Electrical and Electronics Engineers (IEEE), since 2010. I consult and collaborate on ACC applied research projects involving data communication and wireless systems.

EDUCATION

Red River Community College
Certificate in Adult Education **2019**

Assiniboine Community College
Telecommunications Engineering Technology-Diploma **1991**

CAREER SUMMARY

Assiniboine Community College
Instructor-Communications Engineering Technology **2003-Currently**
Development and redevelopment of the program as well as the development of all of the courses that I teach. Besides teaching fulltime, I have also been coordinating and advising on student applied research projects for the last 18 years.

Image Wireless Communications
Technical Coordinator-Engineering **1998-2003**
Responsible for the design, commissioning and maintenance of licensed wireless video and internet access systems throughout Saskatchewan.

Downlink Satellite
Communications Technologist **1995-1998**

Sky Cable
Manager, Engineering Services **1993-1995**

The Competitor
Technician **1991-1993**

HIGHLY QUALIFIED PERSONNEL

Roy, Marie Undergraduate (Completed) Supervised 1994 - 1997
Isotope geochemistry in petroleum engineering
Isotope geochemistry
V-P (Research), Earth Analytics Inc., Calgary, Alberta

MEMBERSHIPS

International Engineering Technologist IntET (Canada)
Canadian Council of Technicians and Technologist / International Engineering Alliance

CET
Certified Technicians and Technologists Association of Manitoba (CTTAM)

1. Most significant contributions to Research and/or to Practical Applications

1. (2021). CTTAM President. I feel my most significant contribution to industry has been the last 13 years that I have spent on the Certified Technicians and Technologists Association of Manitoba (CTTAM) Board of Director in various roles. I have had the opportunity to make an impact locally in Manitoba guiding an Association that oversees the certification of Engineering Technicians and Technologists. This role saw me participate on joint committees with the Engineers Geoscientists of Manitoba (EGM), attend regular meetings with the Association of Consulting Engineering Companies of Manitoba Association, and attending meetings at the Manitoba Legislature to lobby for changes in limited liability legislation.

   As a Director on the Council of Certified Technicians and Technologists (CCTT) for 6 years, I was able to work with other provincial representatives in addressing National issues. CCTT at the time also oversaw the operations of the Canadian Technology Accreditation Board (CTAB). CTAB was responsible for accrediting Engineering Technology programs across Canada based on a set of National Technology Benchmarks (NTBs) that they maintained. As the IEA signatory for Canada, CCTT was also empowered to award the designation of International Engineering Technologist to those that qualified.

2. (1998). SkyCable Inc. Wireless Internet Access System. This was the first system of its kind to be installed in Canada and only the second in North America. This system required a wireless transmitter at a customer's premise for a true 2-way wireless internet access. Due to concerns by Industry Canada on this new wireless digital technology, the system needed to be tested under an experimental license from Industry Canada. As Engineering Manager at SkyCable, I was the lead on this project. The team also consisted of members from California and Israel.

   This technology has now matured and is proving to be essential in delivering connectivity to both urban and rural locations that lack the infrastructure for hardwired systems. Shortly after our trials, several companies were able to secure funding under the Rural Broadband Initiative to launch wireless internet services in rural under serviced area of Canada.

3. (2016). IEA Meetings in Malaysia. I was very proud to have the opportunity to represent Canada as part of the CCTT delegation in attending the IEA meetings in 2016. The signatories of the Accords meet every two years to discuss global criteria for engineering education as well as certification and licensing standards. The signed accords between the signatories allow for international recognition of credential and allows for mobility of engineering professionals. I feel these agreements and standards are fundamental to creating HQP and facilitating research and collaborations between professionals around the globe.

4. (2019) Advisor, Project: Voice Controlled Guidance System. Students developed a voice activated audible guidance system for our College. This project kicked off with students and representatives from the Vision Loss Rehabilitation Canada (VLRC) to understand the current technology available and determine what the requirements would be a guidance system and concerns. One students developed the voice recognition and command technology while another developed the tracking system using beacon technology. Throughout the project a visually

challenged VLRC employee visited the College to test prototypes and provide feedback. This feedback was used to implement changes and additional features. The input students received from VLRC was invaluable. Not only was the representative visually challenged, but was familiar with all forms of assistive technology available and had tested most of them. The project finished with a fully working system that received praise from VLRC and according to them was the only voice controlled navigation system that they knew of. This project received national news coverage.

5. (2019) Advisor, two projects:
   a. Bee Aware: Smart Beehive. The scope of this project was to create a smart connected Beehive that would reduce operational costs and increase production of the operations at 4K Honey. This project included modification beehives with electronics and sensors as well as designing a wireless network that would provide connectivity to groups of beehives scattered across large farm operations. This project started with a tour of the facilities and lessons in beekeeping 101. The features and requirements were determined through several meetings and conversations with the sponsor, 4K honey. This project was a great example of ACC working with industry on a research project that created a real solutions for a real problem.
   b. Wildfire Fighter Monitoring System. This project developed a LPWAN system and wearable device that monitored environmental and biomedical conditions (heat, smoke, temp, etc) of the worker as well as location. This system was capable of generating alerts based on the sensor readings and also contained a panic button that would generate an evacuation notice at their GPS location. This prototype allowed a supervisor to monitor the Fighters at a safe location 5 – 10 km away, out of harms way. The supervisor would also be provided with accurate GPS locations, so they could direct them and advise of danger. Phase two, if completed would see the development of a system to upload this data and alerts to a Regional or National monitoring centre. For this project, the student was able to work with employees at the Manitoba Emergency Services Training Center that had real experience with Wildfire Fighting. This input was very helpful in understanding the working environment and some of the design criteria required for this system.

2. Research Contributions and Practical Applications

These projects were all student-based research projects completed as a requirement in the Communications Engineering Technology program at Assiniboine Community College. My role was co-ordinator and technical advisor for these projects that averaged 500 hours for each student involved.

2021:

- Advisor, Project: Development Campus LPWAN Network and IoT Based Soil Sensor for Indoor and Outdoor Soil Monitoring. Students: Chen Hua and Devon Nelson. Industry Collaboration: Assiniboine Community College Ag instructors and researchers

2020:

- Advisor, Project: Smart Tile Drainage System. Student: Wenbin Zhang. Industry Collaboration: Strategic Systems Engineering.

- Advisor, Project: Green House Monitoring and Control System. Student: Prabhsimran Kaur. Industry Collaboration: The Green Spot.
- Advisor, Project: Intelligent Weeding System. Student: Bowne Yang. Industry Collaboration: Decision Works.
- Advisor, Project: Smart Culvert Control System. Student: Salman Hakim. Industry Collaboration: Strategic Systems Engineering.
- Advisor, Project: Wireless Water Quality Measuring Device. Student: Matthew Shurvell.

2019:

- Advisor, Project: Voice Controlled Indoor Navigation System for the Visually Challenged. Students : Fadi Al Sai, Jairo Mosquera. Industry collaboration: Vision Loss Rehabilitation (CNIB)
- Advisor, Project: Bee Aware; Development of Smart Beehive. Student: Kent Collins. Industry Collaboration: 4K Honey
- Advisor, Project: Bee Aware; Development of a Wireless Network to provide Smart Beehive Connectivity. Student: Adam Lennox. Industry Collaboration: 4K Honey
- Advisor, Project: RF Alert FOBS: In-building alert system for senior care facilities. Student: Scott Jersak. Industry collaboration: various healthcare professionals
- Advisor, Project: Count 'N' Care: In-building tracking system to aid emergency responders. Student: Prarthi Gheewala

2018:

- Advisor, Project: Smart City Mobile Air Quality Sensing And Mapping. Student: Russell Dowd
- Advisor, Project: Livestock Weight & Health Tracker. Student: Tyson Mowatt. Industry Collaboration: local dairy farmers.
- Advisor, Project: Smart City Traffic Control System. Student: Brolin Legare
- Advisor, Project: Smart Irrigation System. Student: Jodi Gray

2017:

- Advisor, Project: Energy Harvesting Application .Student: Guillermo Maradiago
- Advisor, Project: GPS Based Livestock Monitoring System. Student: Miguel Chavez
- Advisor, Project: Remote Forest Firefighter Tracking. Student: Chris Nantais. Industry Collaborations: Manitoba Emergency Services Training Center.
- Advisor, Project: Remote Vital Signs Monitoring and Alarm. Student: Gleb Korliakov
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2016:

- Advisor, Project: Connected Home. Student: Pavlo Tovaryansky.
- Advisor, Project: RFID Livestock Inventory Systems. Student: Morgan MacDonald. Industry Collaboration: local livestock producers.
- Advisor, Project: LPWAN Smart Refuse Bin. Student: JinYan Huang.
- Advisor, Project: Room Occupancy Detection System. Student: Angel Torres

3.Other Evidence of Impact and Contributions-Not applicable

4.Contributions to the Training of Highly Qualified Personnel (HQP)

- Industrial Liaison for Applied Research Projects-partnership development for potential applied research projects
- Co-ordinator-Applied Research Project ELTE-0090 course
- Faulty Advisor to students in the Applied Research Project ELTE-0090 course
- Supervisor-direct supervision of two-four students in the Applied Research Project ELTE-0090 course
- Co-Supervisor- of two-four students in the Applied Research Project ELTE-0090 course
- Technical Advisor for trouble shooting student design and build problems
- Assist students with establishing test plans to verify system performance of research projects
- Manage project budgets and ordering of parts, supplies and test equipment
- Instructor-Report Writing and Presentation skills
- Instructor-Project Management skills
- Faculty Advisor-time management skills for students

5.Publications: Not applicable

6.Delay in Research Activity: Not applicable