



## COLLEGE of ENGINEERING AND PHYSICAL SCIENCES

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SCHOOL OF COMPUTER SCIENCE

### MSc Seminar

**Wednesday June 30, 2021 at 2pm via Zoom**

**Patrick Houlding**

*Density in Mobile Ad Hoc Networks –  
How Scalability Affects Networks for Rural Communities in Canada*

**Advisor:** Dr. Daniel Gillis

**Co-Advisor:** Dr. Xiaodong Lin

#### **Abstract:**

Mobile Ad hoc Networks are a way to transmit data between users with little requirement of physical infrastructure. In the past, these networks have been proposed for use following catastrophic events, where standard networking infrastructure (e.g., Wi-Fi or Cellular networks) may be damaged or unable to operate optimally. However, the insufficient availability or complete lack of standard networking infrastructure in remote and rural communities in Canada poses similar communication issues. As such, Mobile Ad hoc Networks have the potential to be employed in remote and rural communities to improve communication and address the digital divide.

One of the primary issues of Mobile Ad hoc Networks is the ability to scale to higher levels of users in the network. By increasing the number of users in the network, the level of density the network is running on increases and thus requires scaling mechanisms to be implemented. There has been a significant amount of research into the ways that MANETs can be scaled to work optimally with a high number of users. While there have been numerous algorithms proposed to solve for this problem, there is seemingly a lack of evidence suggesting at what point these measures should be employed, especially given real world situations. This study will focus on how scalability has been studied and propose a simulation study to be performed to better understand these levels of density we can observe in the real world.