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MASTER'S THESIS

To obtain a **master's degree**
Stream: **Computer Science**
Speciality: **Information Systems Engineering (ISI)**

SECURING THE NEXT GENERATION: AN EXPLORATION OF 5G NETWORK SECURITY CHALLENGES AND SOLUTIONS

Presented by:
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In front of a committee composed of :

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Abstract

The rise of 5G technology has introduced a new era of wireless communications that guarantees unprecedented speed, low latency, and ubiquitous connectivity.

However, notwithstanding this raises concerns about privacy, security and scalability. This thesis explores these challenges and concerns, in addition to exploring solutions in the context of 5G networks, providing foundation and traces the evolution of wireless communications, presenting key concepts such as Network

Slicing (NS), Software Defined Networking (SDN), Network Function Virtualization (NFV), and Multiple Access Edge Computing (MEC). These technologies are the main building blocs of 5G networks and to study its security issues. The thesis audits the current status of 5G security, review the literature, and examine popular techniques for protecting privacy, and ensuring security.

Through case studies, we evaluate the effectiveness of various strategies and provide direction for future research.

Keywords: 5G, Security, Privacy, Scalability, Software Defined Networking (SDN), Network Function Virtualization (NFV), Multi-access Edge Computing (MEC), Wireless Communication.