



**Pole for Doctoral Studies**  
**Center for Doctoral Studies Sciences and Techniques and Medical Sciences**

## **ANNOUNCEMENT OF DOCTORAL THESIS DEFENSE**



**Ms. SLIMANI Khadija**

**Will present their research work with the aim of earning a  
Doctorate**

**Doctoral program: Mathematical-Physical Sciences and New  
Technologies (SMPNT)**

**Discipline: Computer Science**

**Specialty: Telecommunications and Networks**

**On 11/07/2026 at 15H00 at the Conference Hall, National School  
of Applied Sciences of Tetouan, UAE  
Under the Theme**

**DYNAMIC ADAPTIVE AND HYBRID ROUTING  
STRATEGIES FOR UAV-ASSISTED NEXT-GENERATION  
COMMUNICATION NETWORKS**

**Front of the jury composed of :**

<b>First Name &amp; Last Name</b>	<b>Establishment</b>	<b>Designation</b>
Pr. LAAZIZ Yassin	ENSA of Tangier, UAE	President
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Pr. TAHERDOOST Hamed	University Canada West, Vancouver, Canada	Co-Supervisor
Pr. KHOULJI Samira	ENSA of Tetouan, UAE	Supervisor

*Host Research Structure:* Research Laboratory of Innovative Systems Engineering (ISI), ENSA of Tetouan.

## Abstract

UAV (Unmanned Aerial Vehicle) networks are becoming a key component of next-generation communication systems, especially in the context of 6G. They offer advantages such as rapid deployment, high mobility, and infrastructure-free communication. However, UAV networks are highly dynamic, with frequent topology changes and unstable connectivity. They also face constraints such as limited energy, strict latency, and high reliability requirements. Traditional MANET routing protocols are not suitable for these environments. Existing solutions, including geographic and AI-based methods, are often too complex and resource-intensive. They introduce high control overhead and are not adapted to lightweight UAV systems.

This thesis addresses the need for a real-time, adaptive, and efficient routing framework. The goal is to ensure low latency, high reliability, scalability, and energy efficiency. At the same time, the solution must remain lightweight and avoid complex computations. A multi-stage methodology is adopted, including literature review, modeling, design, and simulation. The work identifies a lack of lightweight adaptive routing solutions in current research. To address this gap, a Dynamic Adaptive Routing (DAR) framework is proposed.

DAR integrates link quality estimation, mobility prediction, and energy awareness. It uses multi-metric decision-making to dynamically select optimal routes. The framework is evaluated using the NS-3 simulator under various conditions. Results show significant improvements compared to existing protocols like AODV and DSDV. Latency is reduced by 20–30%, while packet delivery ratio improves by 15–22%. Throughput increases by about 18%, and energy consumption decreases by 25%.

The thesis contributes a systematic review, a lightweight routing model, and simulation validation. Overall, DAR provides a scalable and efficient solution for UAV-based 6G communication networks.

**Keywords:** UAVs; 6G Communication; Routing Protocols; Network Performance; DAR.