**OUTLINE GRADUATION THESIS**

**Tên đề tài:** Định vị trong hệ thống 5G MIMO Millimeter wave bằng phương pháp Distributed Compressive Sensing (S-OMP)

**THESIS TITLE:** Position Estimation Through MillimeterWave MIMO in 5G Systems using Distributed Compressive Sensing (S-OMP)

**ABSTRACT**

Millimeter wave signals and large antenna arrays are considered enabling technologies for future 5G networks. While their benefits for achieving high-data rate communications are well-known, their potential advantages for accurate positioning are largely undiscovered. We derive the Cramér-Rao bound (CRB) on position and rotation angle estimation uncertainty from millimeter wave signals from a single transmitter, in the presence of scatterers. We also present a novel two-stage algorithm for position and rotation angle estimation that attains the CRB for average to high signal-to-noise ratio. The algorithm is based on multiple measurement vectors matching pursuit for coarse estimation, followed by a refinement stage based on the spacealternating generalized expectation maximization algorithm. We find that accurate position and rotation angle estimation is possible using signals from a single transmitter, in either lineof-sight, non-line-of-sight, or obstructed-line-of-sight conditions

***Keywords:***

**TÓM TẮT**

***Từ khóa:***

**AUTHORSHIP**

*“I hereby declare that the work contained in this thesis is of my own and has not been previously submitted for a degree or diploma at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no materials previously published or written by another person except where due reference or acknowledgement is made.”*

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**SUPERVISOR’S APPROVAL**

*“I hereby approve that the thesis in its current form is ready for committee examination as a requirement for the Bachelor of Electronics and Telecommunication degree at the University of Engineering and Technology.”*

Signature:………………………………………………

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