



**Lundi**  
**28 juillet 2025**  
**12 h**  
**Local Z5-3001**

PROGRAMME DE SCIENCES DES RADIATIONS ET IMAGERIE BIOMÉDICALE

SÉMINAIRE DE RECHERCHE À LA MAÎTRISE (2/2)

## AUTOMATIC INTRACRANIAL STENOSIS DETECTION IN THE CIRCLE OF WILLIS FROM TOF-MRA

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DIRECTION DE RECHERCHE:

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PRÉSENTATION ÉTUDIANTE:

OMMAY HABIBA

THE CIRCLE OF WILLIS (COW) IS A CRITICAL NETWORK OF COLLATERAL ARTERIES IN THE BRAIN THAT AFFECTS CEREBRAL BLOOD FLOW. INTRACRANIAL STENOSIS, OR ARTERIAL NARROWING IN THE COW DUE TO THE FORMATION OF ATHEROSCLEROTIC PLAQUES, CAN LEAD TO CEREBROVASCULAR AND NEURODEGENERATIVE DISEASES. MEASURING DIAMETER VARIATIONS ALONG THE ARTERIES' CENTERLINE IS ESSENTIAL FOR ASSESSING THESE NARROWINGS. HOWEVER, THE VOXEL-BASED CENTERLINE EXTRACTION INVOLVES EXTENSIVE COMPUTATIONS AND LACKS PRECISION DUE TO VOXEL RESOLUTION DEPENDENCY AND THE DISREGARD FOR ARTERIAL GEOMETRY. ADDITIONALLY, KISSING VESSELS, DUE TO LIMITED IMAGE RESOLUTION, ARE OFTEN NEGLECTED IN PREVIOUS STUDIES, LEADING TO INACCURATE CENTERLINE EXTRACTION. THIS RESEARCH AIMS TO DEVELOP A PRECISE CENTERLINE EXTRACTION METHOD FROM THE ARTERIAL SURFACE AND CONSTRUCT A MODEL TO AUTOMATICALLY DETECT AND MEASURE INTRACRANIAL STENOSIS SEVERITY IN THE COW USING TOF-MRA IMAGING.