NOURA **HAMZE** | RESUME

PhD in Computer Sciences

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my webpage

About me: I am researcher and teaching fellow at the University of Strasbourg, France. Recently, I fulfilled my PhD in computer sciences in the Computer Graphics and Geometry group (IGG) at the ICube laboratory. I am generally interested in most areas of computer graphics for surgical purposes. My primary area of research involves the path planning of surgical tools in image-guided surgery. In particular, I focus on geometric constraints solving, physical simulation, and optimization techniques. The main domains on which I worked on are neurosurgery and percutaneous procedures.

❯ COURSEWORK

Algorithm and Programming
Academic work Methodology
Human-Machine Interfaces
Development Techniques
DataBase Systems

❯ LANGUAGE SKILLS

Arabic · English · French

❯ TECHNICAL SKILLS

Operating Systems:
Linux · Windows
Programming Languages:
C++ · Prolog · Php · Visual Basic
Medical Frameworks:
MITK · SOFA
Graphics Libraries:
VTK · ITK · CGAL · boost · qt
Other:
QtCreator· Paraview· ITK snap·
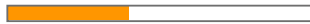SQL · svn· git · LATEX

❯ EXPERTISE DOMAINS

Surgical path planning

Geometric constraints solving

Biomechanical simulation

Multi-objective optimization

Programming

❯❯❯ Research Projects

ACouStiC	**Computer Assisted Surgical Planning in Deep Brain Stimulation**

❯ We addressed the problem of deformation resulting of the "Brain Shift" phenomenon to calculate safe tools trajectories subjected to surgical rules.

❯ We proposed a novel approach for multi-objective optimization in neurosurgery path planning.

HAYSTACK	**Needle Insertion Planning in Percutaneous Procedures**

❯ We addressed the problem of adjusting tools trajectories because of soft tissue deformation and flexible needle deflection while needles are inserted inside the body.

❯ We introduced a preoperative path planning algorithm which couples a geometric solver with FEM physics simulations.

❯❯❯ Education

2016 / 06	**PhD. in Computer Sciences**	University of Strasbourg

❯ Preoperative path planning and optimization in static and deformable conditions for image-guided minimally invasive surgery.

2010 - 2012	**MSc. in Computer Graphics**	University of Strasbourg

❯ In the 6 month internship research we addressed the "Perspective geometry textures" for decomposing a 3D surface into a compact set of height maps to enhance rendering performance.

2001 - 2006	**License in Software Engineering**	University of Aleppo

❯ Artificial Intelligence and Natural Languages Processing.

❯❯❯ Selected Publications

❯ N. Hamzé, J. Voirin, P. Collet, P. Jannin, C. Haegelen, and C. Essert. **Pareto front vs. weighted sum for automatic trajectory planning of Deep Brain Stimulation**, Medical Image Computing and Computer Assisted Intervention (MICCAI'16), Athènes, Greece, October 2016.

❯ N. Hamzé, I. Peterlék, S. Cotin, and C. Essert. **Pre-operative Trajectory Planning for Percutaneous Procedures in Deformable Environments**, Computerized Medical Imaging and Graphics, Elsevier, page 16–28, Volume 47, January 2016. doi:10.1016/j.compmedimag.2015.10.002