

# Kinematics Modeling and Trajectory Planning for the Skull Reconstruction Robot

Weiqun Wang<sup>1</sup>, Xiru Wang<sup>2</sup>, Zeng-Guang Hou<sup>1</sup>, Zhijie Fang<sup>1</sup>,  
Yuze Jiao<sup>1</sup>, Yangyu Luo<sup>1</sup> and Jian Gong<sup>3</sup>

1.the State Key Laboratory for Management and Control of Complex Systems,  
Institute of Automation Chinese Academy of Sciences, China

2.Department of Electronics, Polytech Nice Sophia, France

3. Department of Pediatric Neurosurgery, Beijing Tiantan  
Hospital, Capital Medical University, China

- A skull reconstruction robot has been developed firstly in the world
- The contour data for cutting are obtained based on the laser scanning sensor
- A PCA based method is designed to ensure the end tools perpendicular to the skull surface
- A polynomial interpolation based method is designed to construct the curves between adjacent key points.

