# Vision guided learning based bimanual robot sewing
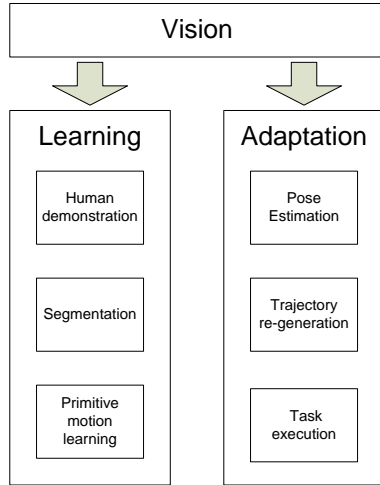


Fig. 1: System overview of bimanual sewing robot

*Abstract—*

## I. INTRODUCTION

Bimanual manipulation-suturing is important and challenging. Our task is stent graft manufacturing

Unsolved problems: Path planning Adaptive to new context

Our solutions: Vision + learn from demonstration Path planning - learning from demonstration, needle tracking, tool tracking Adaptive to new context - object centric approach + vision guided

[1]

## II. SYSTEM OVERVIEW

Figure 1

### A. Vision System

Needle tracking / re-detection

### B. Learning from human demonstration

Human demonstrate how to sew stent graft Tracking needle (object centric approach) Motion segmentation Primitive motion learning

### C. Task execution

Needle pose re-detection Trajectory adaptation

## III. EXPERIMENTS

### A. System setup

### B. Human demonstration

### C. Learning

### D. Task execution

## IV. CONCLUSION

## REFERENCES

[1] Bidan Huang, Sahar El-Khoury, Miao Li, Joanna J. Bryson, and Aude Billard. Learning a real time grasping strategy. In *Robotics and Automation (ICRA), 2013 IEEE International Conference on*, pages 593–600, 2013.