Yisong Zhao

Faculty of Surgery
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EDUCATION

The Chinese University of Hong Kong — Paris, France
Phd in Surgery — Sept 2024 – Present

The Chinese University of Hong Kong — Paris, France
RA in EE (Electronic Engineering) — Mar 2023 – Sep 2024

Sorbonne Universite — Paris, France
MS in Communicating Systems — Sept 2021 – Jun 2023

Sorbonne Universite — Paris, France
BS in EEA (Electrique Energie Automatique) and Mathematical — Sept 2019 – Jun 2021

Paris Diderot Universite — Paris, France
BS in Physique and Mathematical — Dec 2018 – Jun 2019

. Note: 18.6/20

PROJECT EXPERIENCE

Extracorporeal Research: Hong Kong Aug 2023 – Present

Development of Robot-Assisted Multi-modal Imaging System

- **Three-Dimensional Robotic Vascular Imaging System**

System integrating robotic technology and three-dimensional imaging capabilities, it can accurately locate and scan blood vessels, generate clear three-dimensional vascular structure images, provide intuitive spatial information support for vascular disease diagnosis, interventional therapy, etc., and features both operational flexibility and imaging precision.

- **Photoacoustic/Ultrasound Image-Guided Robotic Visual Servoing Task**

The robot visual servoing task guided by photoacoustic/ultrasound images integrates multimodal images from photoacoustics (providing high-contrast functional information) and ultrasound (offering deep-penetration structural information). It extracts target features in real time, calculates motion deviations via visual servoing algorithms, and drives the robot to dynamically adjust its posture, forming a closed loop of "image feedback-motion correction". This enables high -precision tracking, positioning, or manipulation of targets, combining imaging complementarity and real-time control, and is applicable to scenarios such as precision medicine.

Intracorporeal Research:

The structural design, kinematic control and simulation, and control theory based on the Cosserat mechanical model of continuum robots.

Personal, Project Group — Aug. 2022 – Present

We have completed the design of three sets of continuum robot mechanisms with distinct functions. Among them, one continuum robot is capable of tracking surgical instruments using a constant curvature motion model, and we have also developed an umbrella-shaped probe for gastric cancer detection. Additionally, by leveraging the Cosserat model, we have achieved accurate estimation of the flexible segment of the continuum robot and realized precise control of its position and posture under force control.

PUBLICATIONS

1. Yi-Song Zhao “An umbrella-inspired snap-on robotic 3D photoacoustic endoscopic probe for augmented intragastric sensing: Proof of concept study”, Dec 2023, *Photoacoustics 35 (2024) 100568*

ADDITIONAL INFORMATION

Language

. English (TOEFL: 104 GRE: 329+3.5), Chinese (Native), French (DELF: C1)

Computer Skills

. C, C++, VHDL, Zmotion， Mathematica， LTSpice, Vivado, MATLAB & Simulink, Xboard, PCB Eagle, Quartus, MBED, Altium, Python, Office