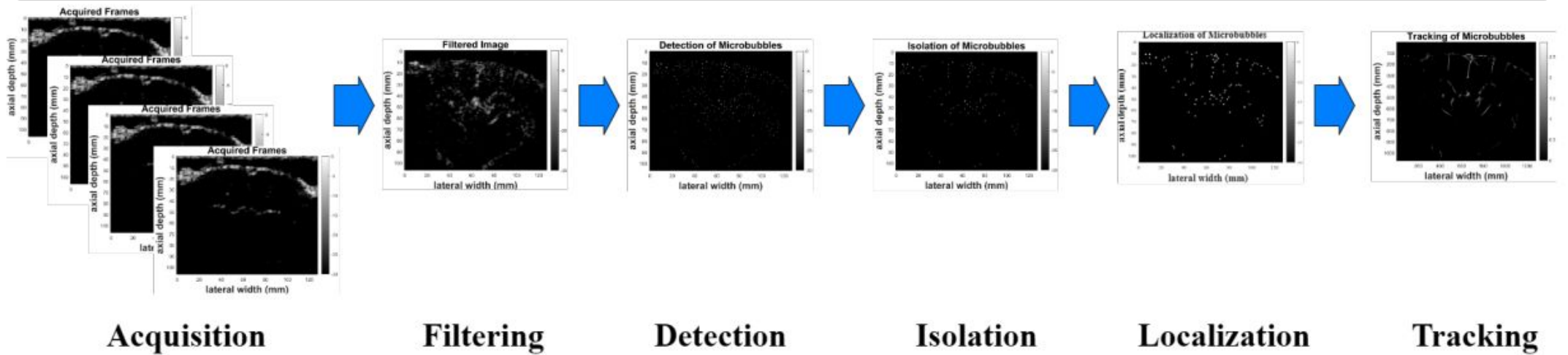


Abstract

This project proposes and explores the use of a simple **SVD trick** on a stream of ultrasound B-mode images capturing the vascular structure in animals to perform **Ultrasound Localization Microscopy** with the help of contrast-enhanced microbubbles. The goal is to output microbubble tracks (blood vessels) from raw ultrasound B-mode images.



Introduction

Biomedical Ultrasound Localization Microscopy (ULM) is a computational bioinformatics field that deals with enhancing ultrasound images using contrast-agents/microbubbles injected into the bloodstream to map the an entire region of blood vessel structure in a non-intrusive, cheap, time efficient and safe manner.

Benefits over SOTA

- Potential to reduce the entire pipeline described in SOTA to just a **simple tensor reshape and an SVD**.
- Skip the entire pipeline and produce directly the **microbubble tracking results**
- Simultaneously **denoise the input**, if corrupted with noise
- Produce nearly **real-time results** with a promising application
- Potentially generalize to not only point tracking in 2D images, but also could be extended to **point-tracking in 3D spaces**.
- **Compress** the video sequence and save storage space

