

# Rock Solid Diagnostics

Unearthing deadly stones



# MEET OUR TEAM MEMBERS

## B1 GROUP 4



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# PURPOSE

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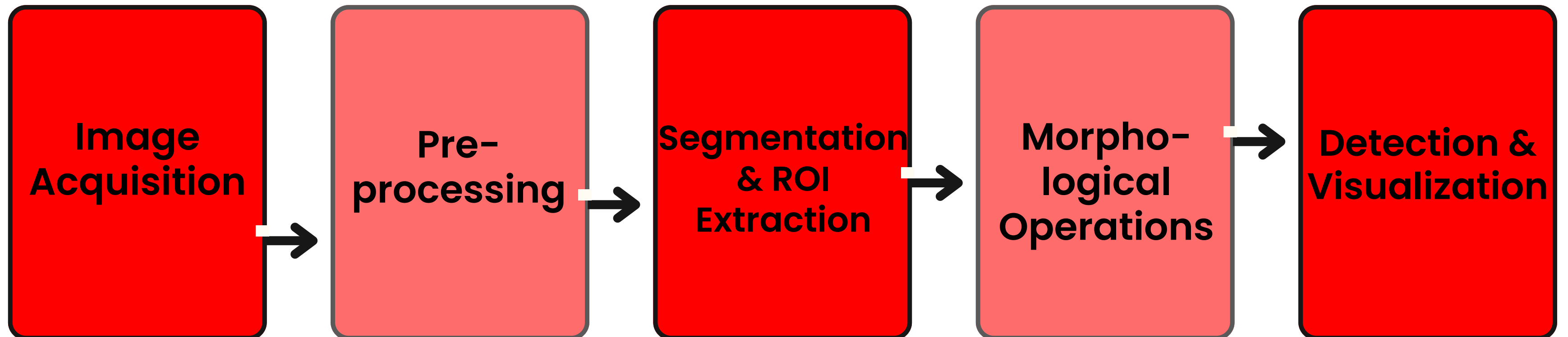
Developing an automated kidney stone detection system using image processing techniques in MATLAB, enhancing early diagnosis, accuracy, and efficiency in medical imaging analysis.



# FEATURES

- ☑ Automated image processing
- ☑ Region of interest (ROI) extraction
- ☑ Thresholding and segmentation
- ☑ Noise reduction and object filtering
- ☑ Stone detection and marking
- ☑ Overlay visualization
- ☑ User-friendly approach

# Workflow Overview



# IMAGE PREPROCESSING

**Grayscale  
Conversion**

(rgb2gray)

**Binarization**

(imbinarize)


**Noise  
Removal**

(bwareaopen,  
imfill,  
medfilt)



# ROI EXTRACTION



- ▶ **Focusing on relevant kidney areas**
  - ▶ **Defining the ROI portion (roipoly)**
  - ▶ **Enhancing analysis**
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# CLEANING OPERATIONS

- ☑ **Erosion & Dilation to remove noise**  
(imerode, imdilate)
- ☑ **Using Median Filtering Process**



# STONE DETECTION



01

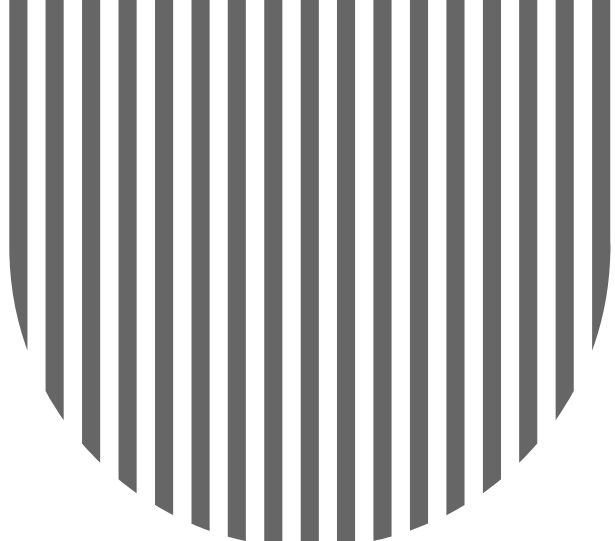
Finding objects  
(bwlabeled, regionprops)

02

Filtering objects based on  
size (stones fall within a  
specific area range)

03

Highlighting detected  
stones (viscircles)

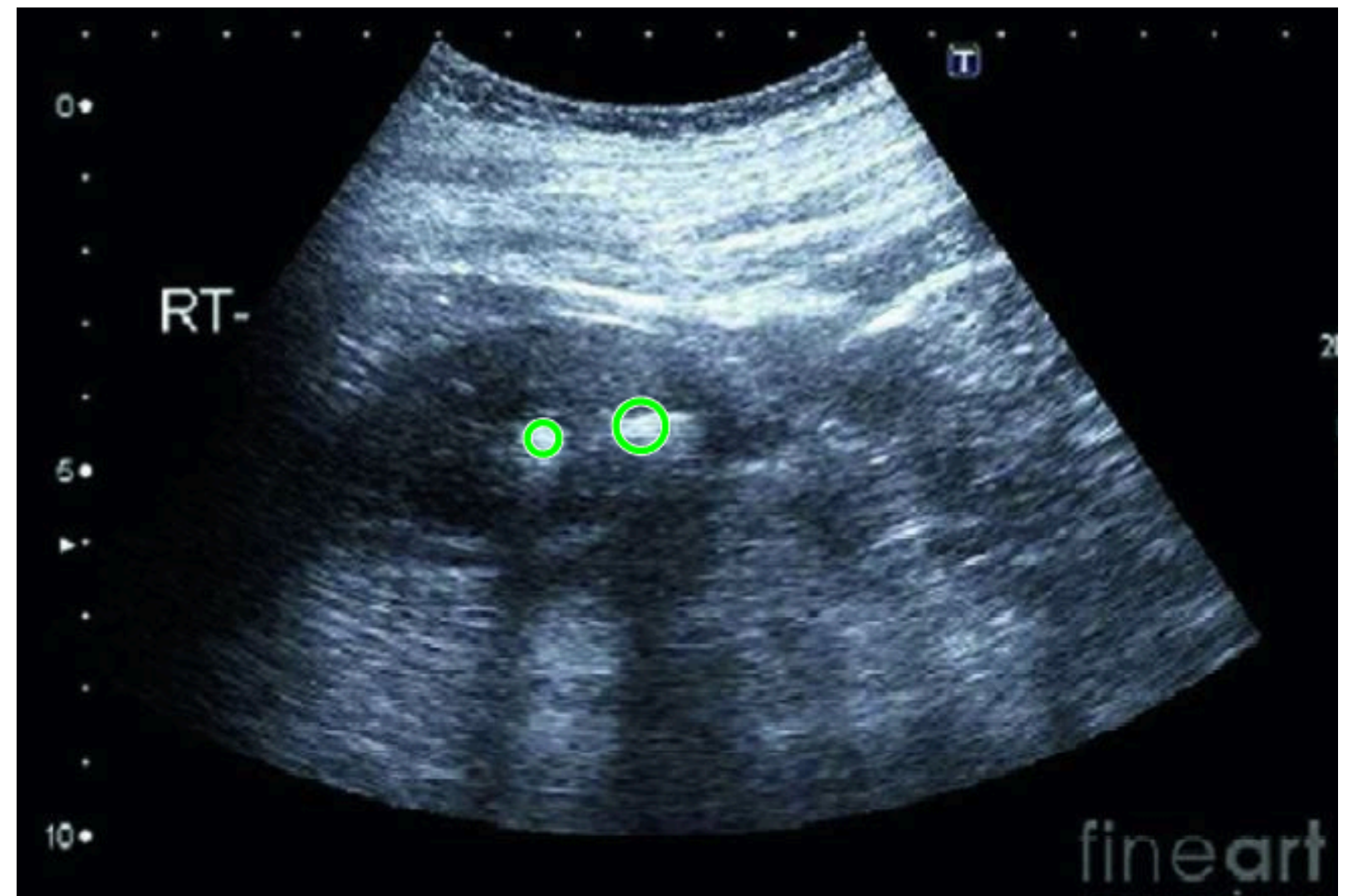


# OUTPUT & VISUALIZATION

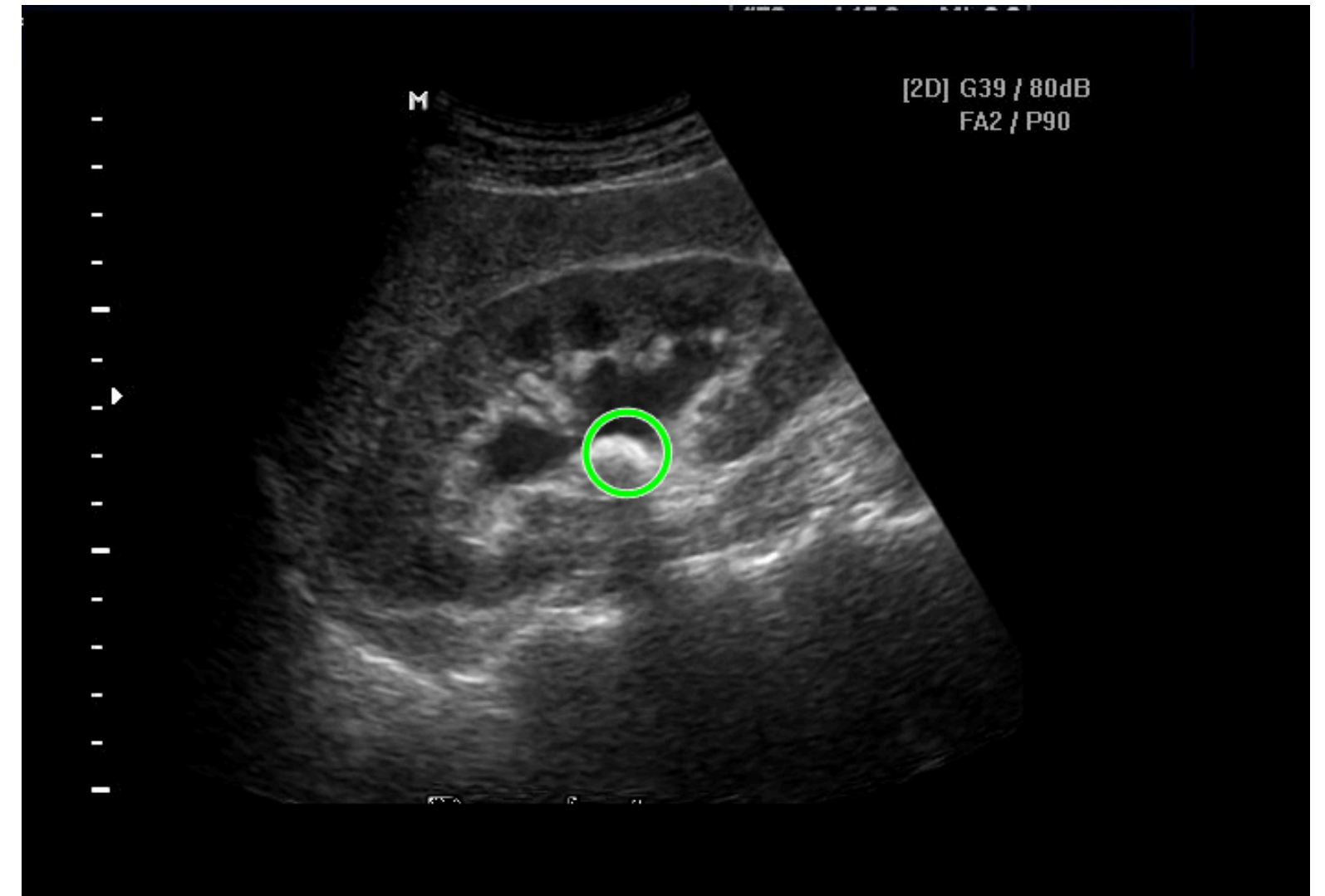
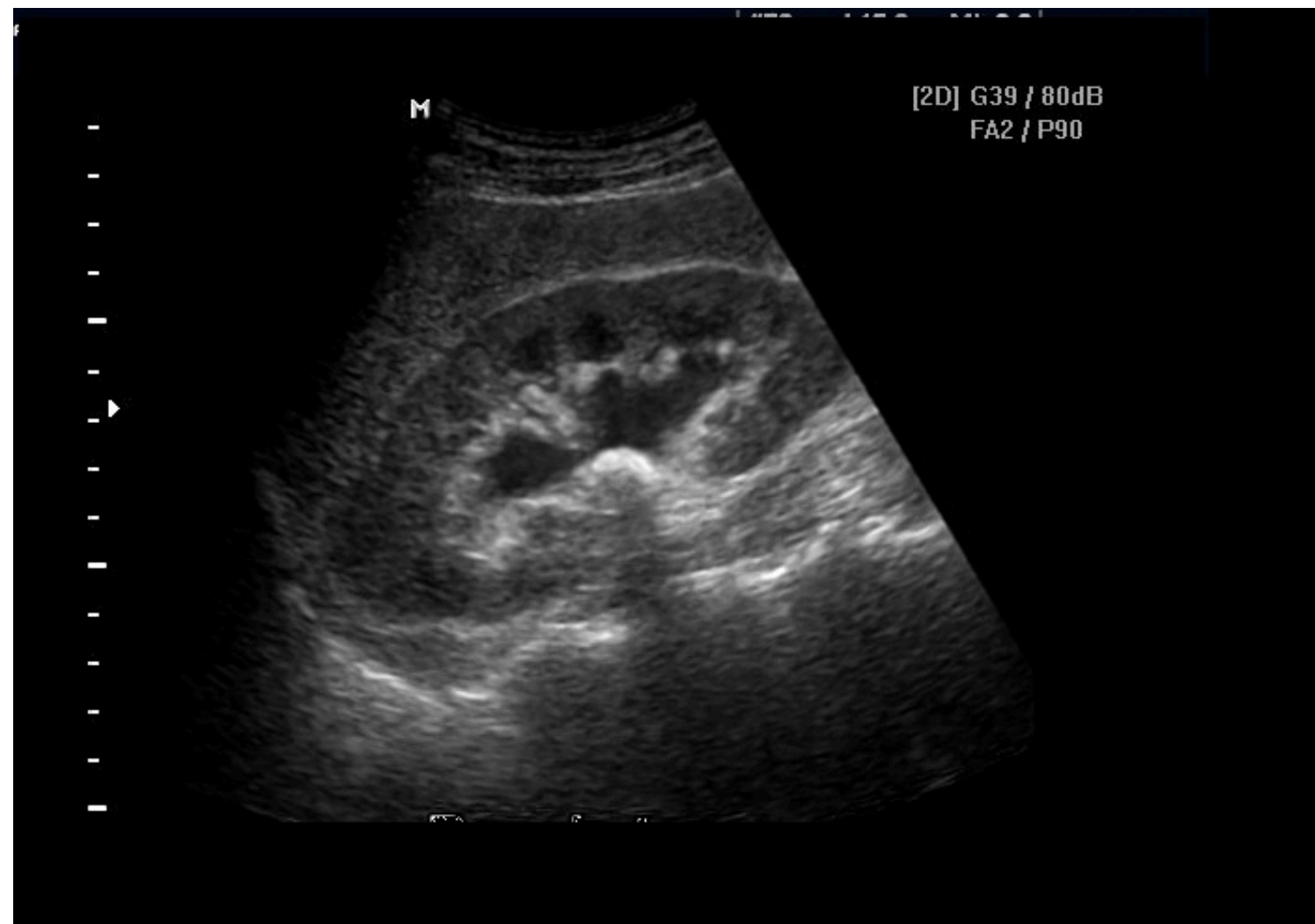
- **Display the original image with detected kidney stones**
- **Overlay detected stones on the image for better visualization**



# IF STONES ARE DETECTED



# IF STONES ARE DETECTED





# IF STONES ARE NOT DETECTED



**THANK**

**YOU**