

Figure (1): Examples of challenges in medical image analysis for surgical tool detection

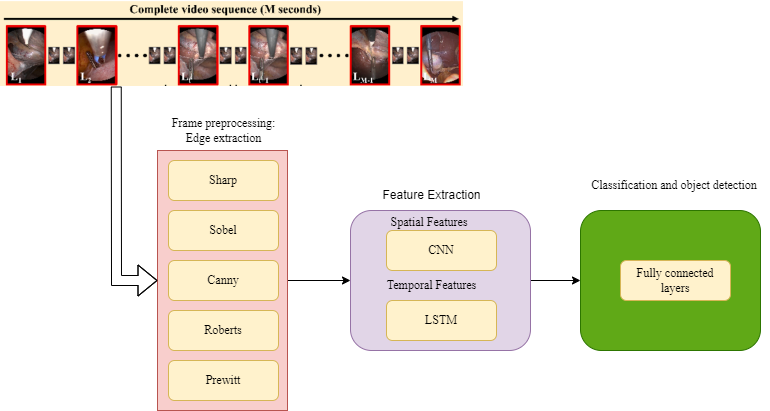


Figure (2): General Process of the Proposed Method

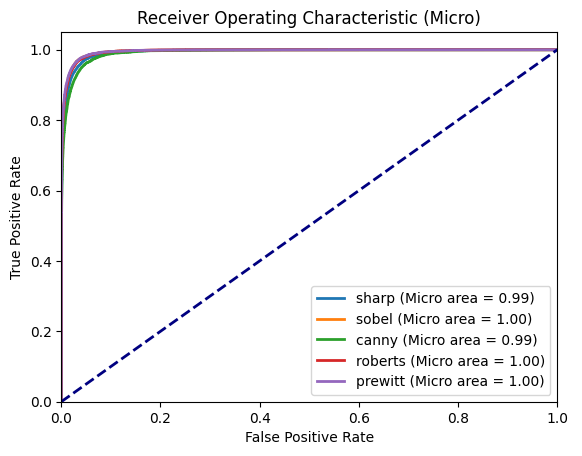


Figure 3: ROC curve for receiver operating characteristic (Micro)

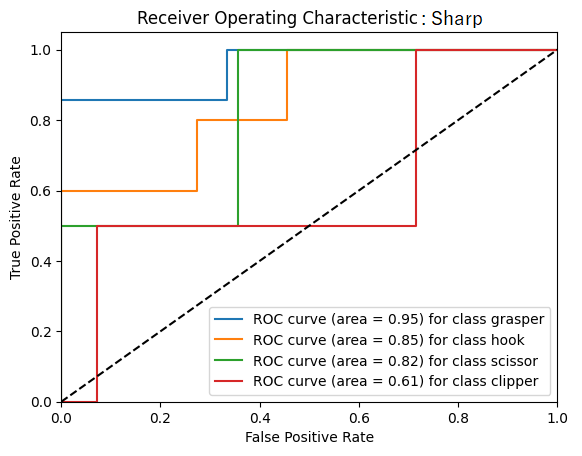


Figure 4: ROC curve for detecting the type of surgical instrument using the Sharp filter

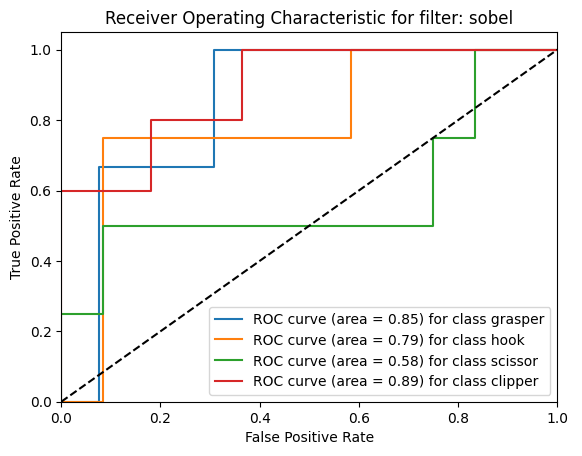


Figure 5: ROC curve for detecting the type of surgical instrument using the Sobel filter

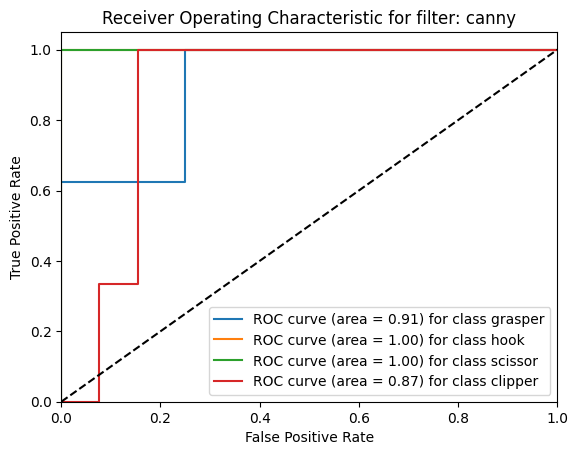


Figure 6: ROC curve for detecting the type of surgical instrument using the Canny filter

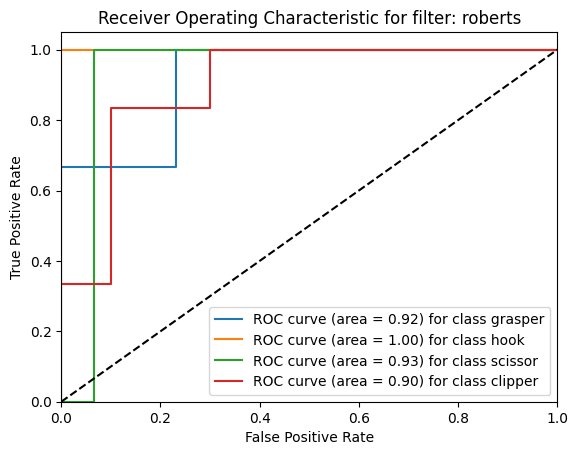


Figure 7: ROC curve for detecting the type of surgical instrument using the Roberts filter

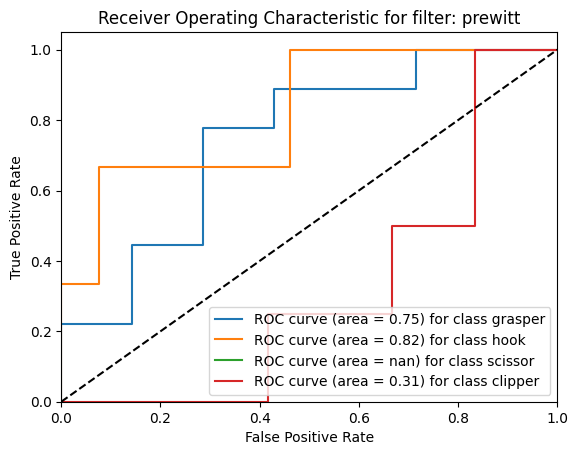


Figure 8: ROC curve for detecting the type of surgical instrument using the Prewitt filter