



ForensicExaminer: Testbed for Benchmarking Digital Audio Forensic Algorithms

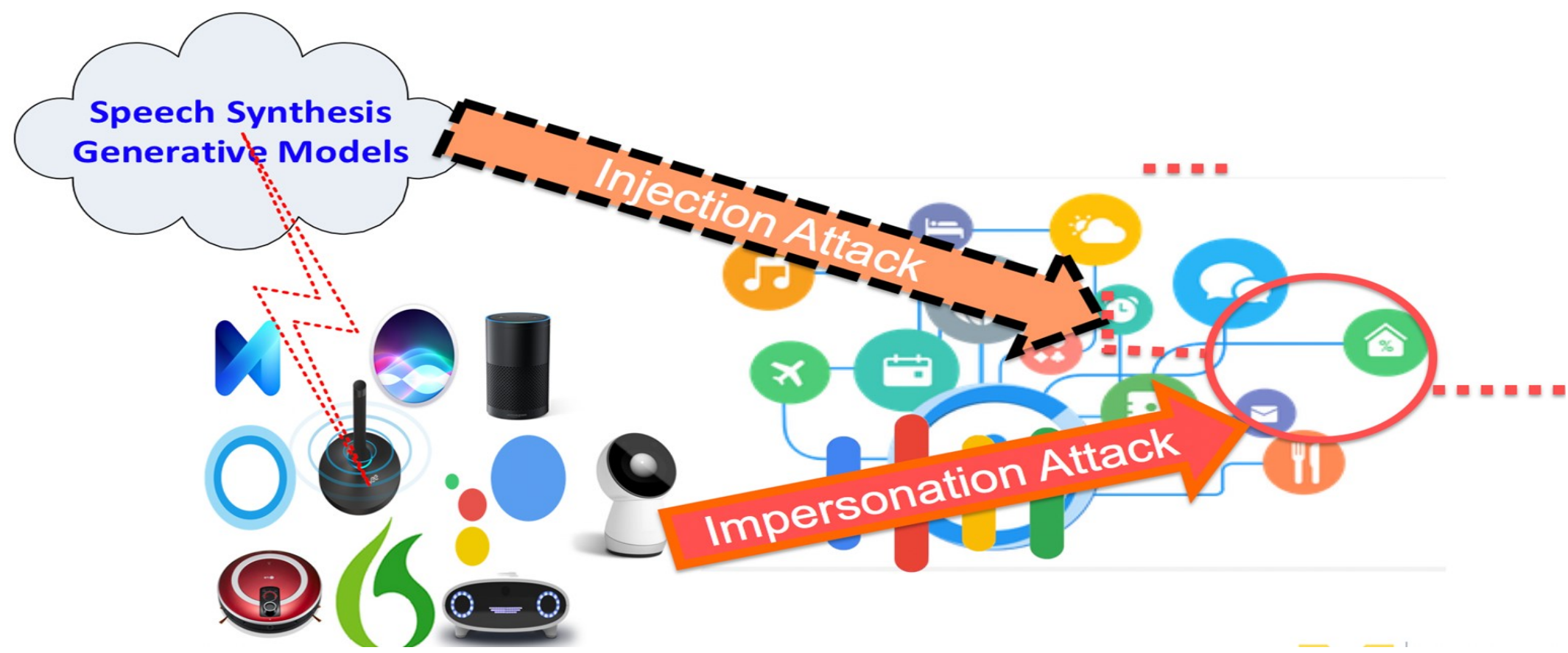


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The goal of this project is to develop a framework for digital audio forensic analysis, study the impact of anti-forensic attacks on detector performance, replay and cloning attack on speaker recognition system, and design such a benchmarking testbed.

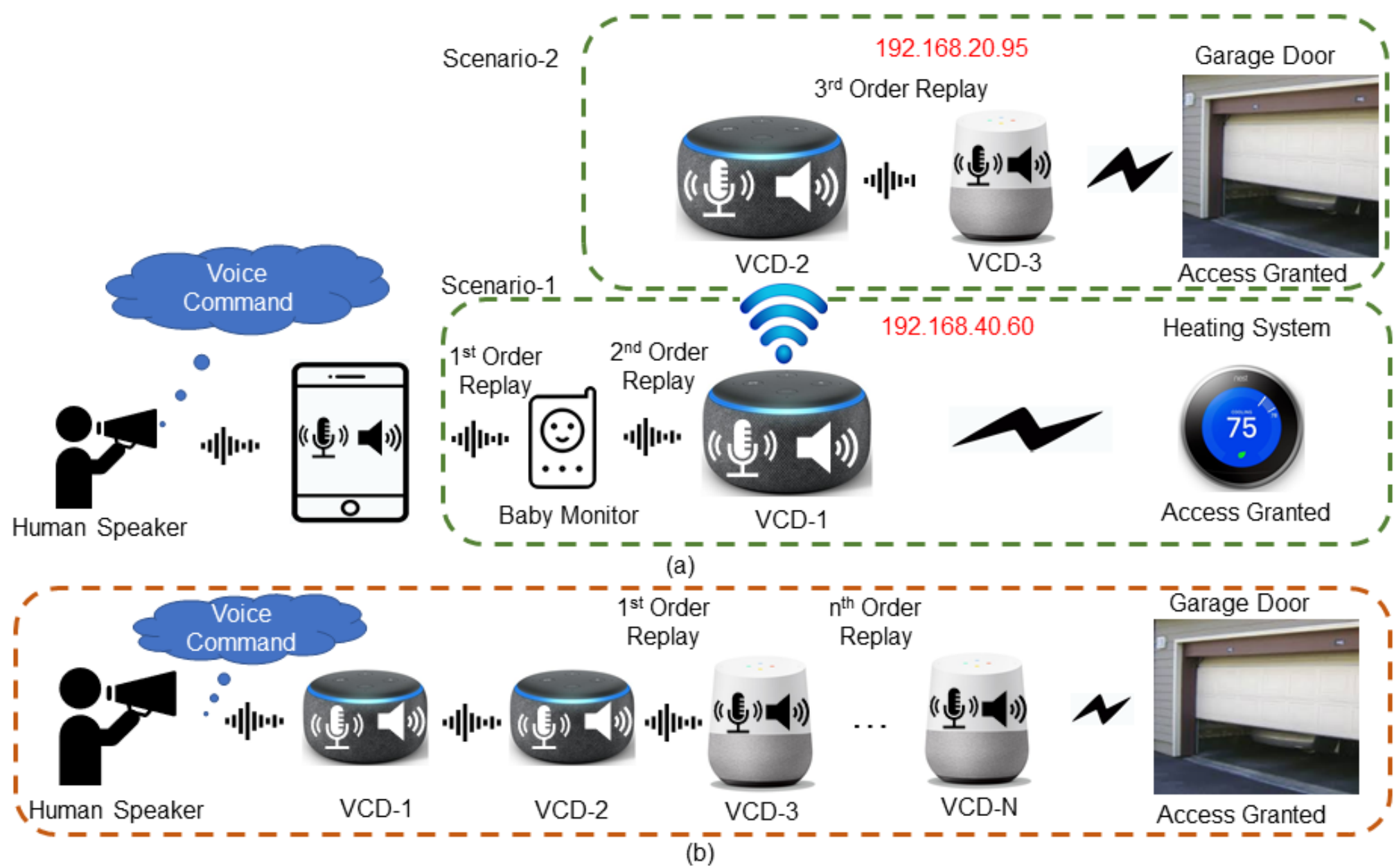
Key Challenges

- Increased Attack Surface for Voice controlled systems: Multi-order voice spoofing Attacks (i.e. replay-, cloning, and cloned-replay)



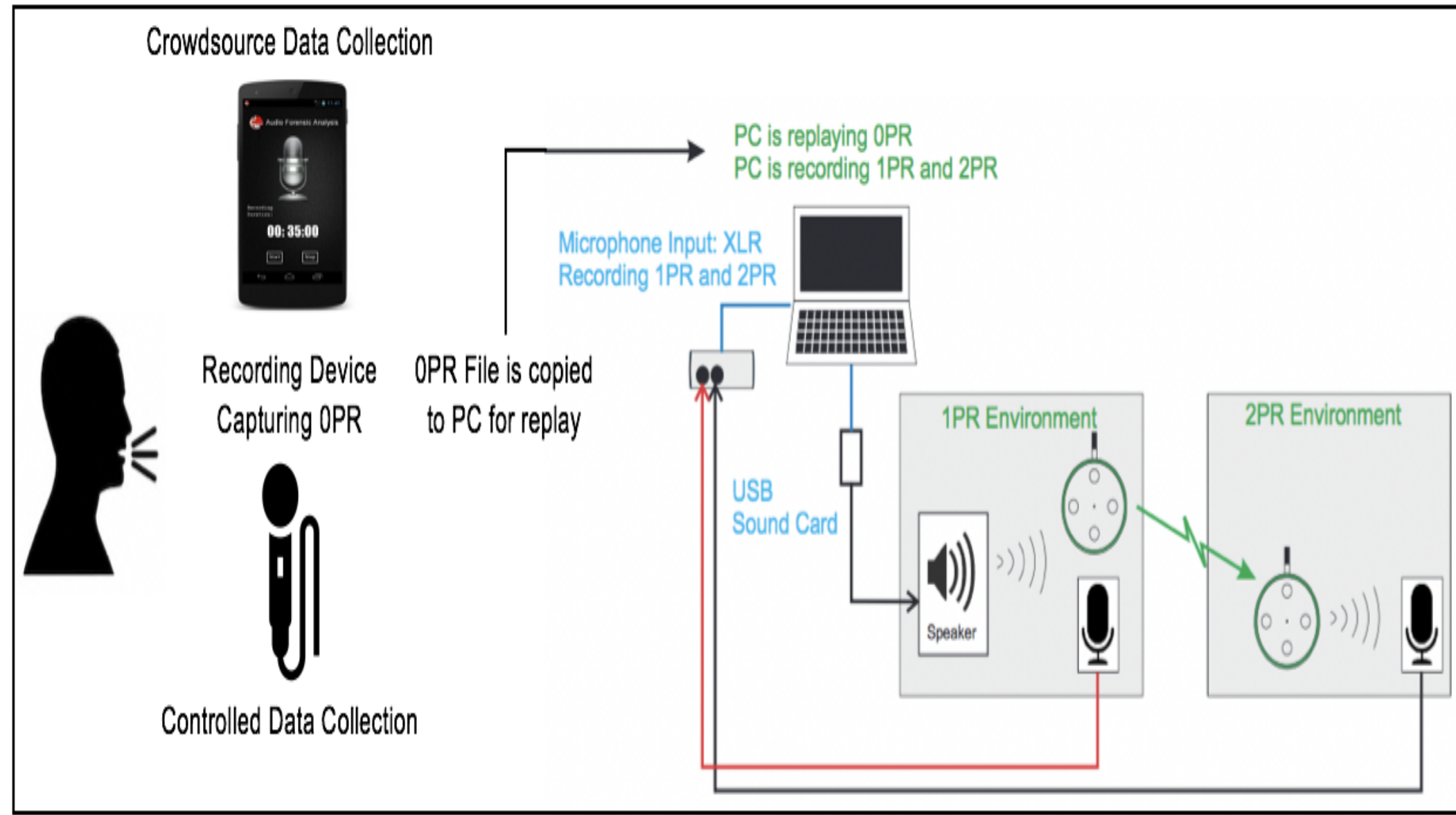
- Non-availability of multi-order Voice spoofing Dataset.
- Non-availability of Unified Light-weight Anti-spoofing System.

Vulnerability Analysis of Voice Controlled Systems



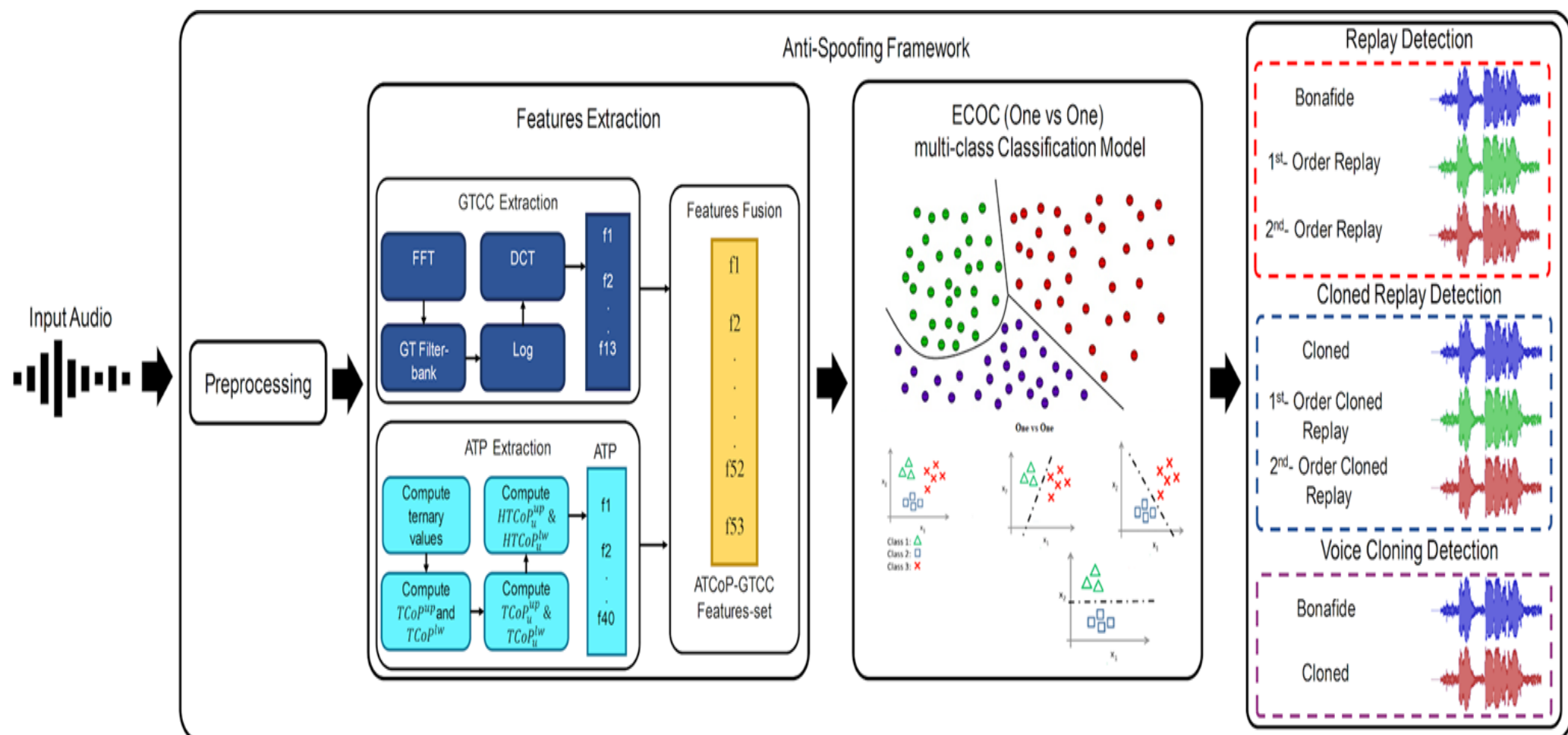
Dataset Creation Framework

- One of the largest Voice Spoofing Detection Corpus



Unified Framework for Multiple Voice Spoofing Attacks Detection.

- Robust Acoustic Features adaptable to other multimedia (videos, image) to better detect the forgeries.



Scientific Impact on other CPS Research

- Sensors or ECU fingerprint modeling and extraction algorithms for IoT and Vehicle Forensics.
- Linking generated data to the originating Sensor/ECU IoT and Vehicle Forensics.
- Impact of anti-forensic attacks on existing deep fake and other forgery detectors.
- Analyzing performance of existing and new algorithms under selected anti-forensics attacks on CPS forgery detectors.

Broader impacts

- Broader impacts of research are envisioned in several areas i.e. digital forensics (e.g. deep-fakes), national security, law enforcement, cyberspace, voice-activated services, etc.
- Released Voice Spoofing Detection Corpus for research community
<http://www.secs.oakland.edu/~Mahmood/datasets/audiospoof.html>
- Our educational plan is strongly integrated with the research
 - Integration of Voice Anti-spoofing Solutions in curriculum
 - iDetect Challenge
 - Preparing scientists, engineers, and educators to design and develop mathematical and analytical tools for digital forensic analysis
- **Potential Impact Quantification**
 - Trained 5 REU, 5 Graduate Students and 2 Post-docs
- **Outreach**
 - WXYZ-TV Channel 7: <https://bit.ly/2mbx7FM>
 - The Oakland Post, Oakland University
 - The University Records, University of Michigan
 - <https://record.umich.edu/articles/um-dearborns-hafiz-malik-is-battling-the-future-of-fake-news/>
 - <https://umdearborn.edu/news/all-news/articles/associate-professor-hafiz-malik-battling-future-fake-news>

