Vronicle: Verifiable Provenance for Videos from Mobile Devices

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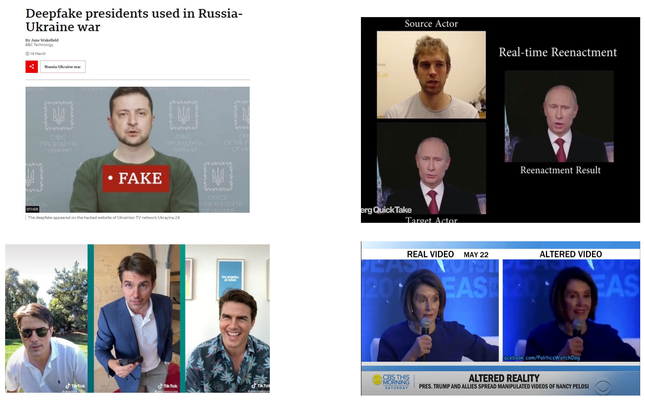
Fake/Manipulated Videos are Everywhere

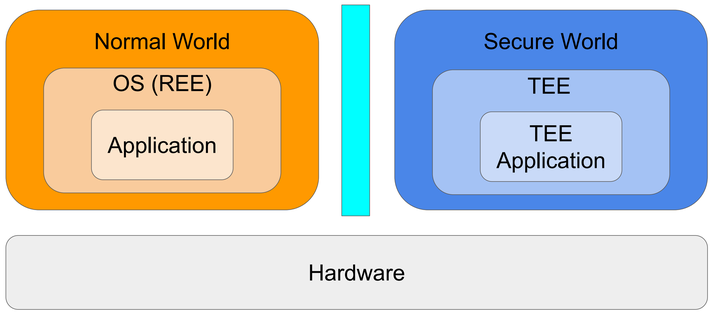


Instead of detection, let's do prevention

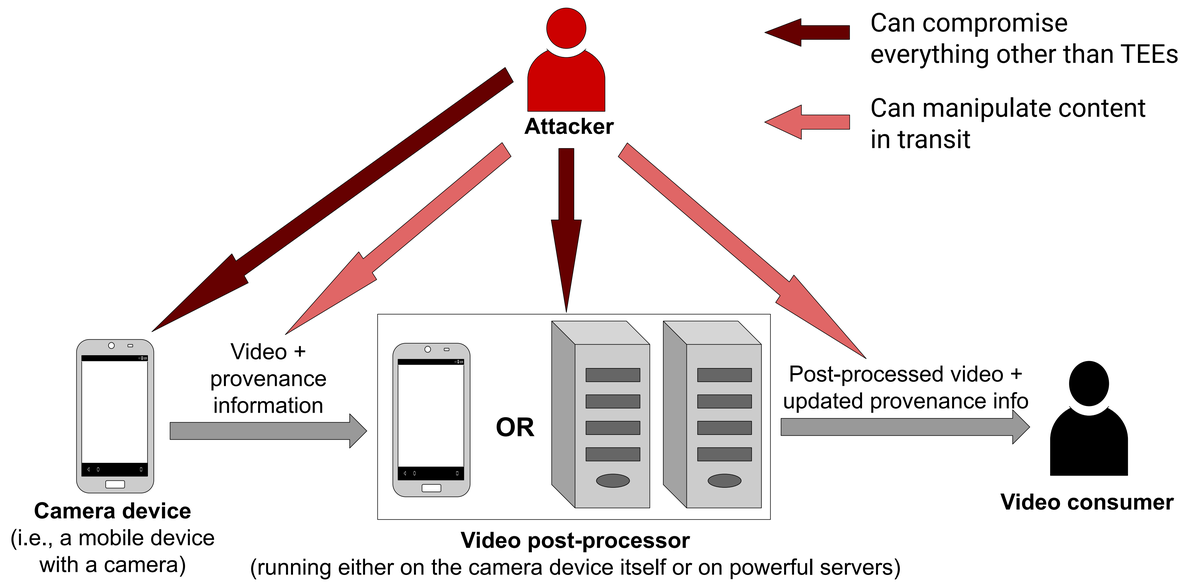
- Need verifiable fine-grained video provenance information that the consumer can use to gain high confidence that the video is authentic.
- Need decent performance of video post-processing.

TEE: Trusted Execution Environment

- A secure area in a processor that creates a completely isolated environment for a program to run.
- Examples: Intel SGX, AMD SEV, Arm TrustZone, …



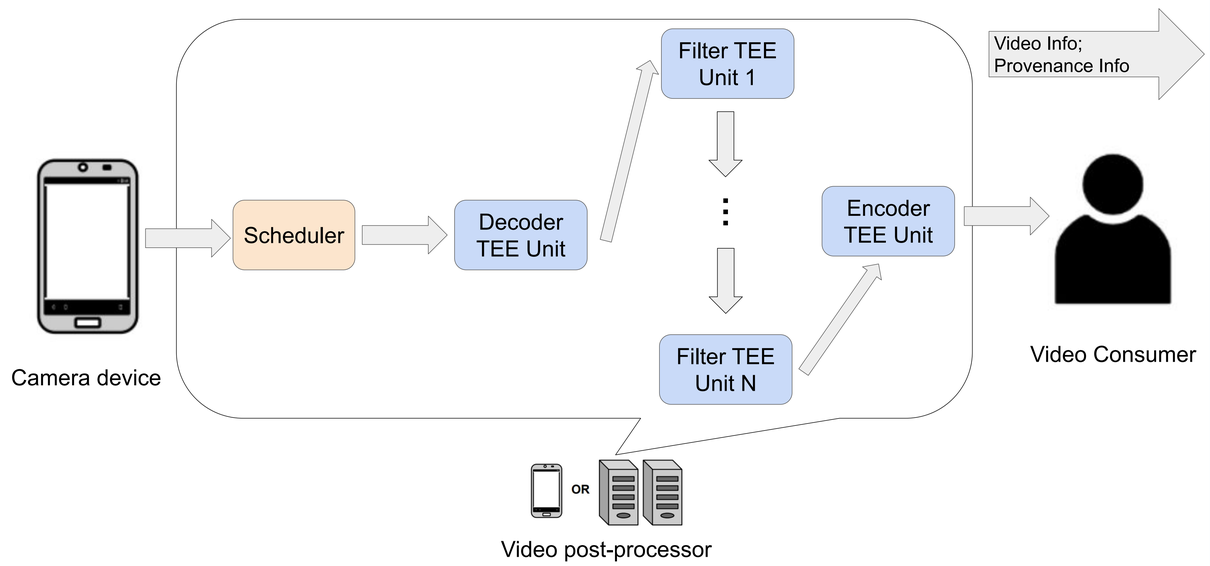
Our Vision



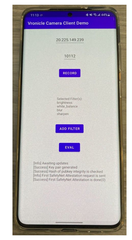
Key Point of Vronicle's post-processor

- *Fixed-function post-processing units*: help identifying each decoder/filter/encoder for verification.

Design of Vronicle's post-processor



Prototype



Camera device:
Galaxy S20 Plus

Azure Confidential Computing

Video post-processor:
Hickey 620 for Arm TrustZone;
Azure Confidential Computing VM for Intel SGX

Video consumer:
Ubuntu 20.04 Desktop