



Face Quality and Vulnerability in eIDV

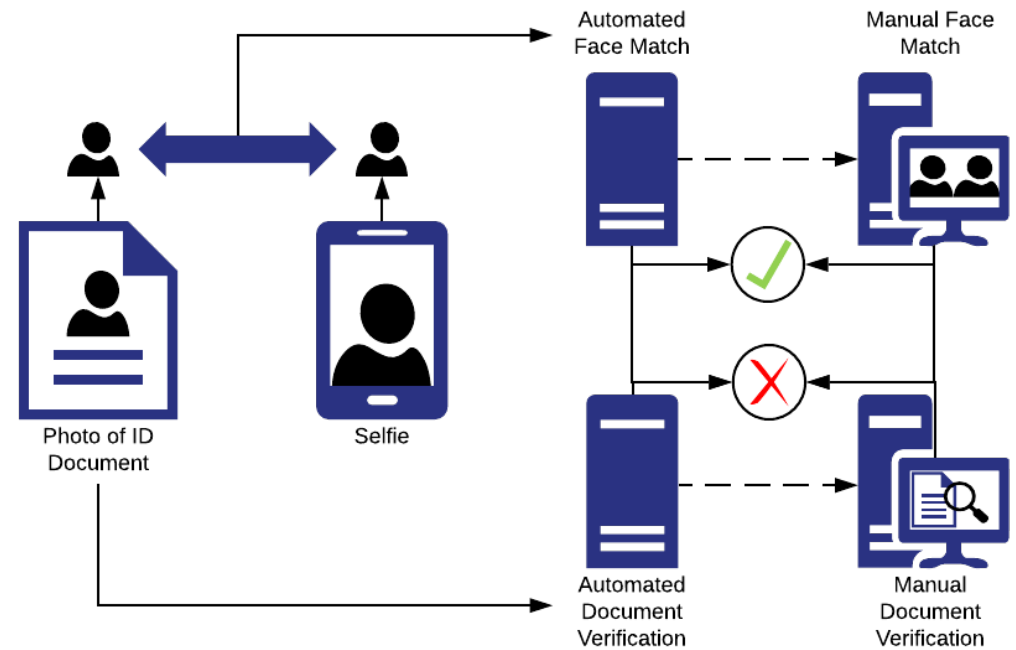
Does facial quality effect system vulnerability and/or PAD ?

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eIDV Solutions

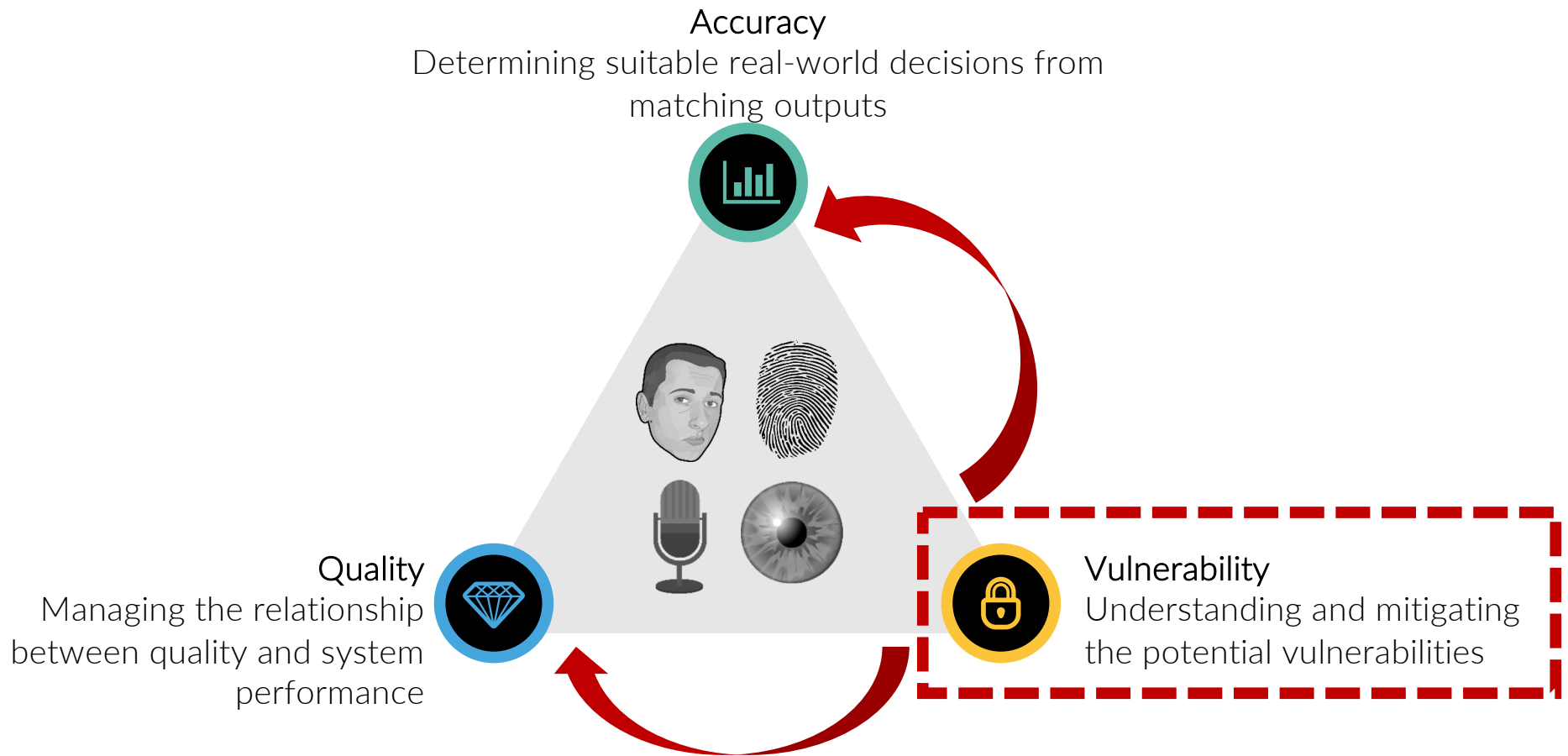


- The use of unsupervised selfies and image capture from a document allows captures with a wide range of quality variation.
- **Question:** Because an attacker has the ability to affect quality on both probe and document, does this lead to higher vulnerability?
- *For this analysis we assume that changing the document image directly can be detected.*



Solutions known as electronic identity verification, or eIDV, verify documents and biometrics remotely via a users mobile device

Biometric Risk Pyramid

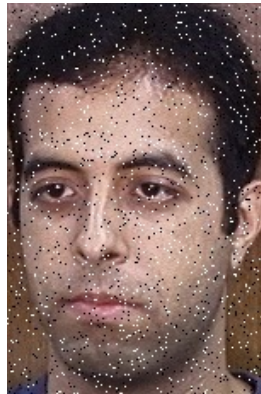


Quality Vs Accuracy

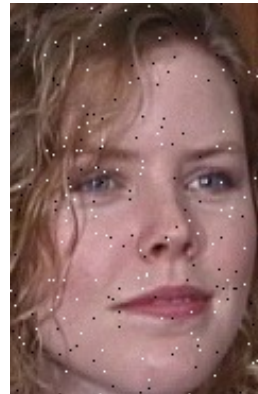
Examples of Quality Variations



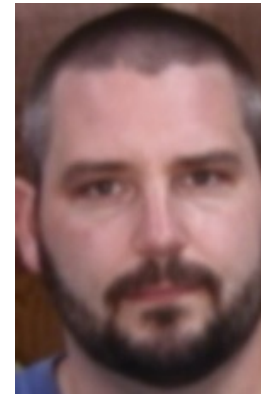
Good Quality



**Salt Pepper
Noise**



**Gaussian
Noise**

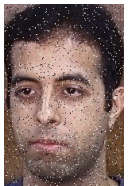


Blur

Effect of quality degradation on comparison score



Good Quality



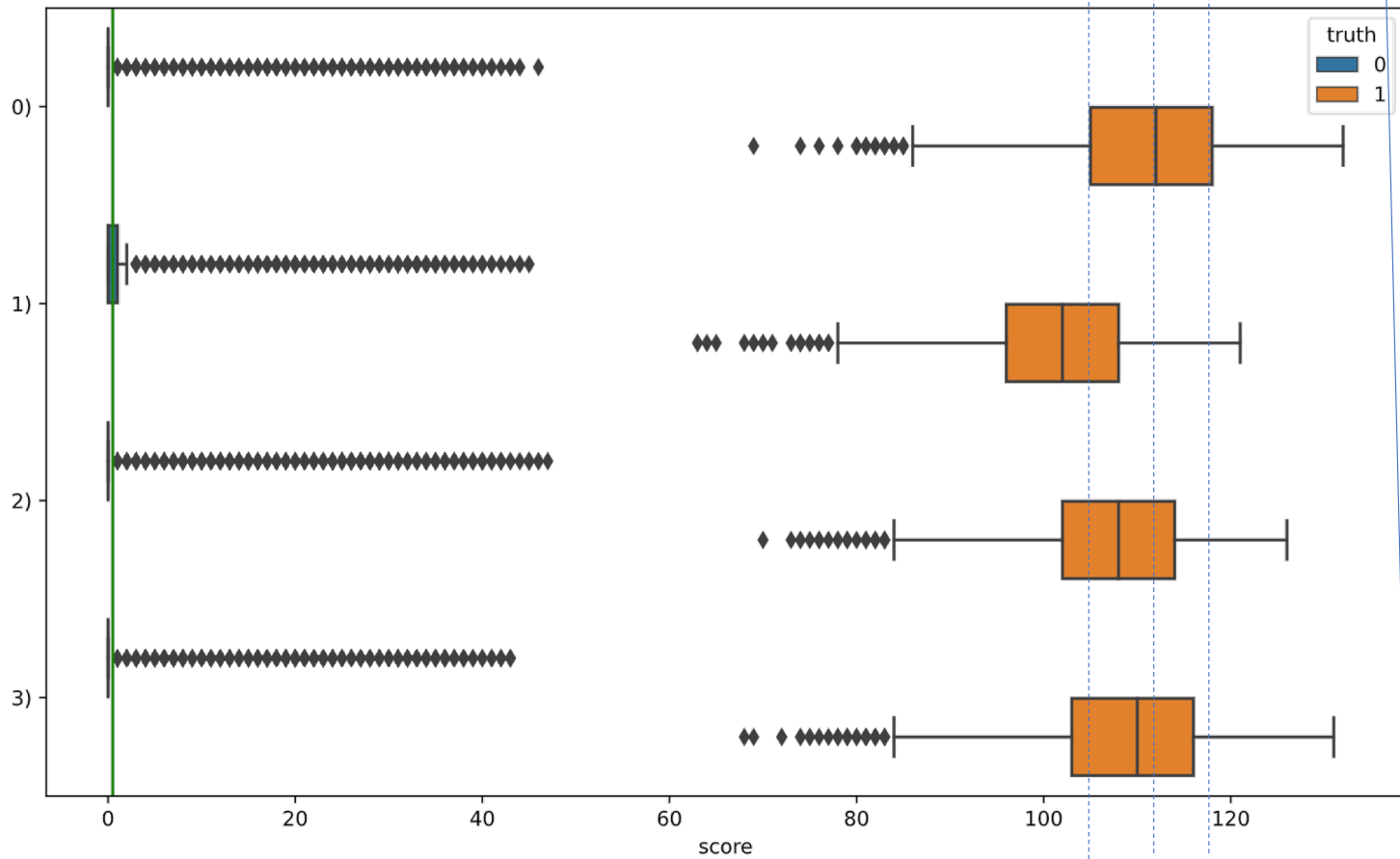
Salt Pepper Noise



Gaussian Noise

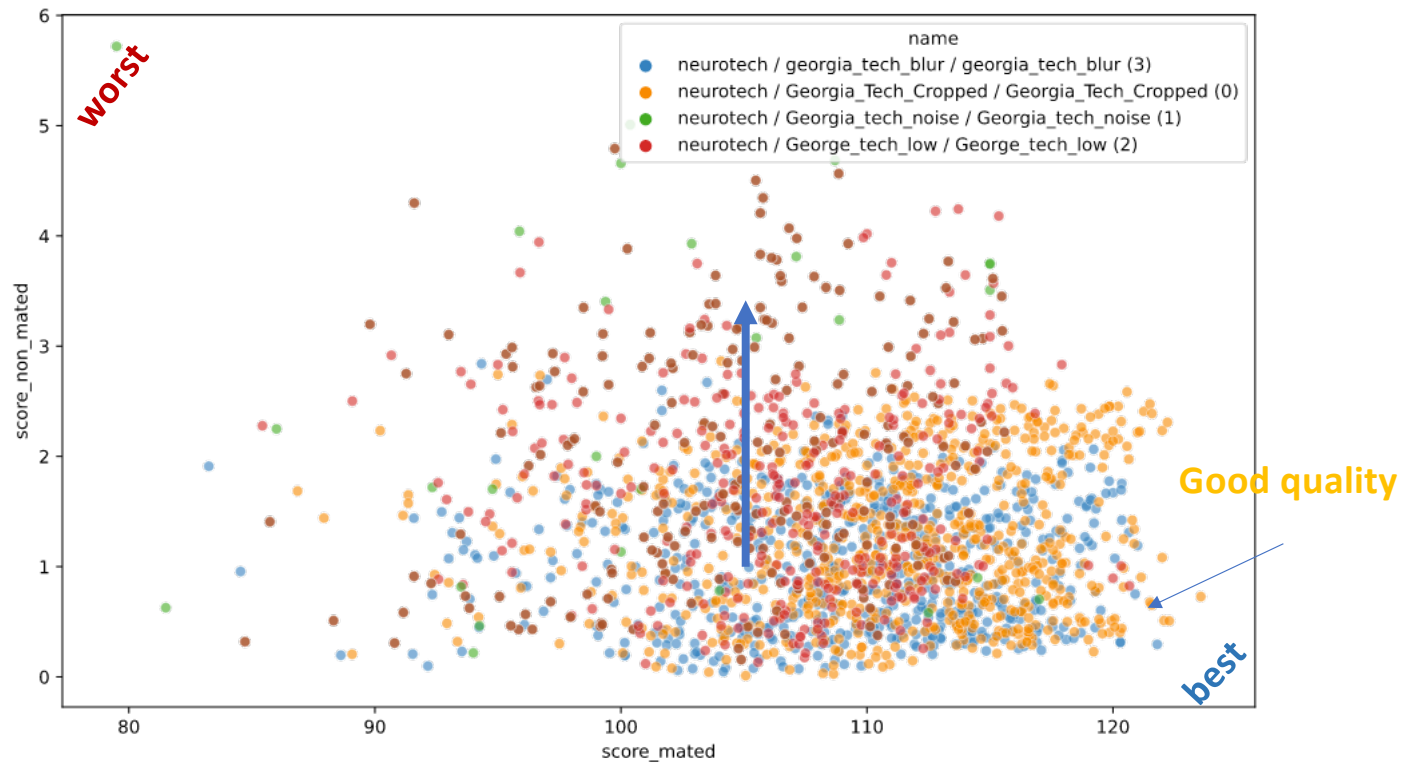


Blur



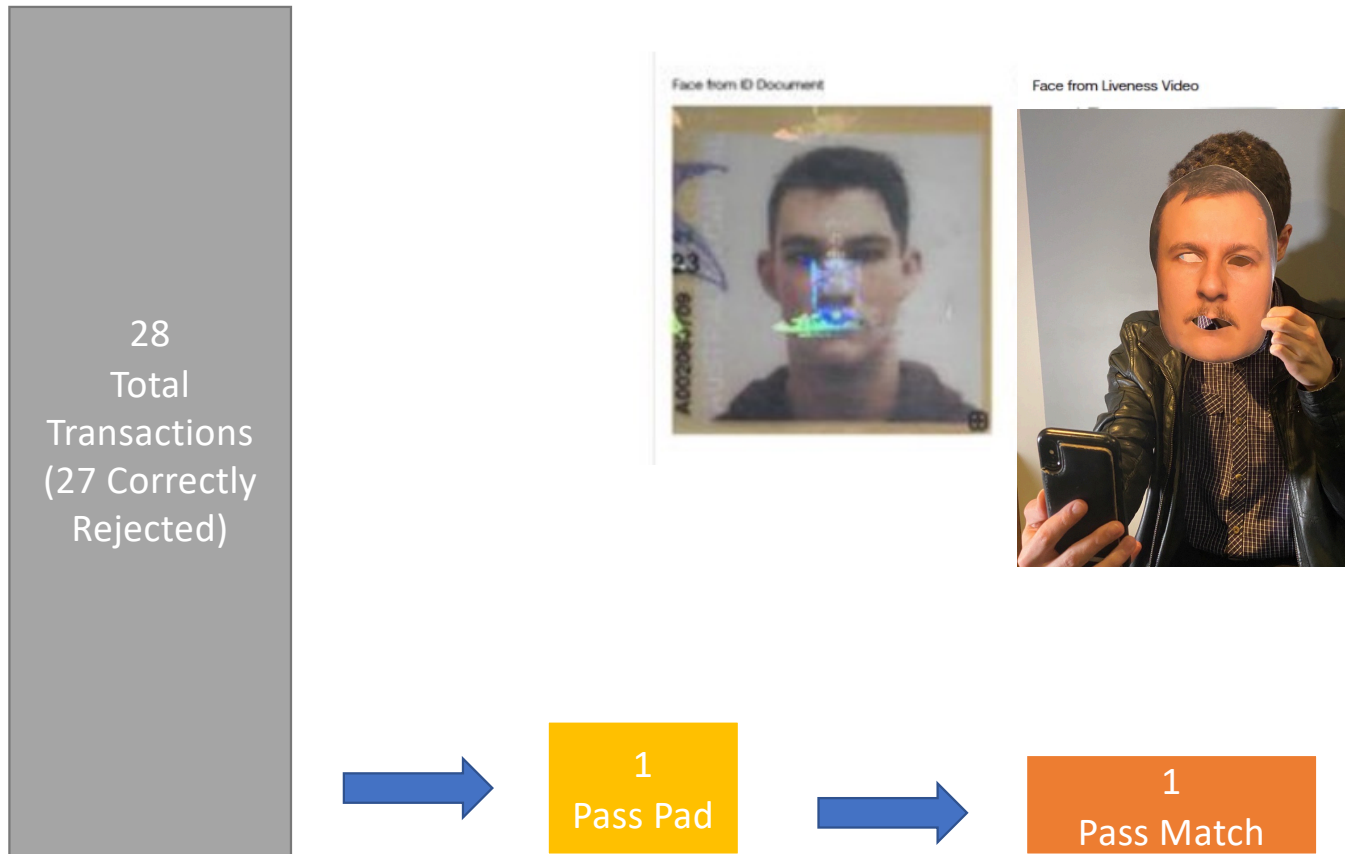
Zoo Plot of Quality

(each dot represents a person)

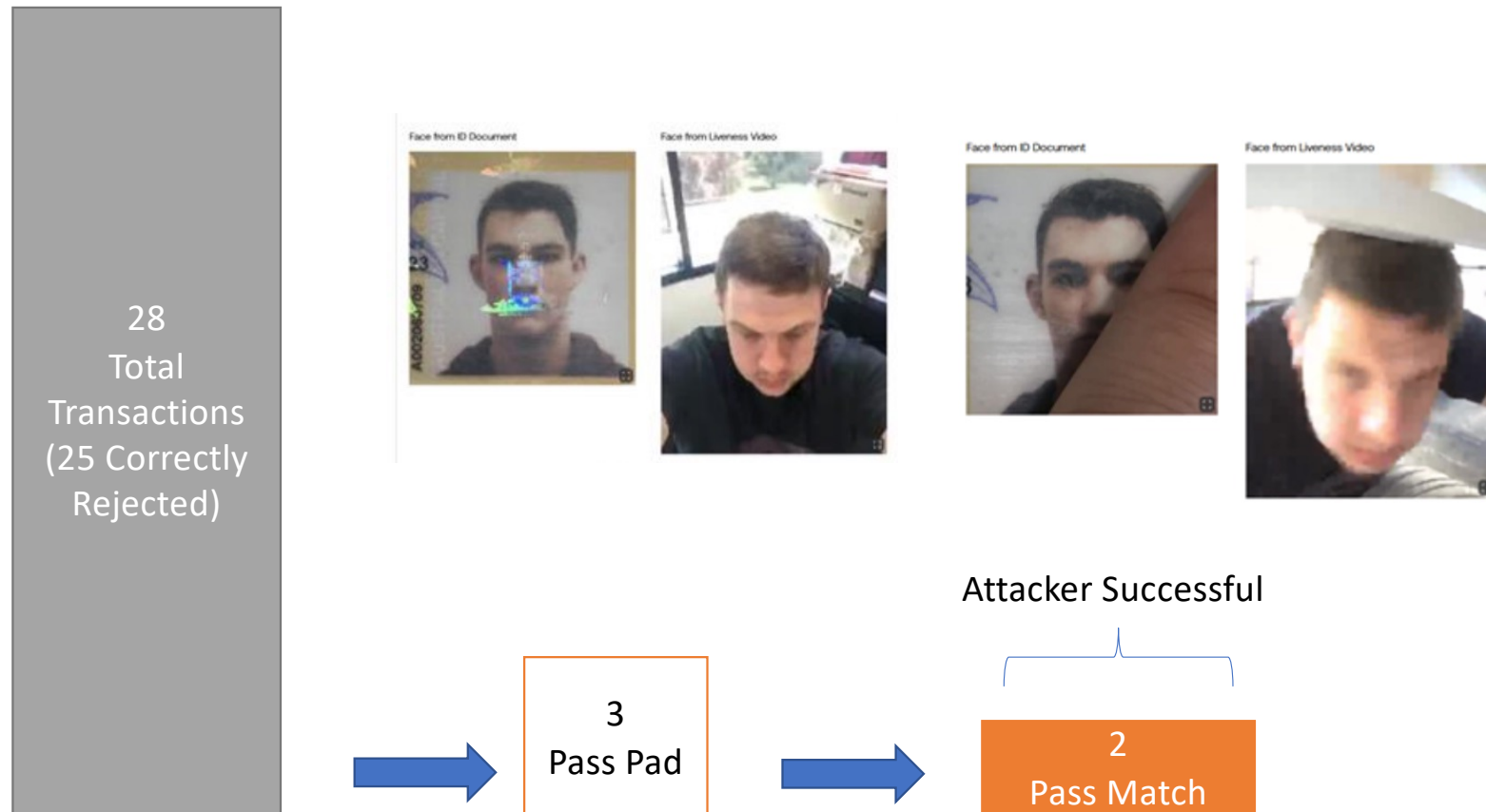


Quality Vs Vulnerability Scenario

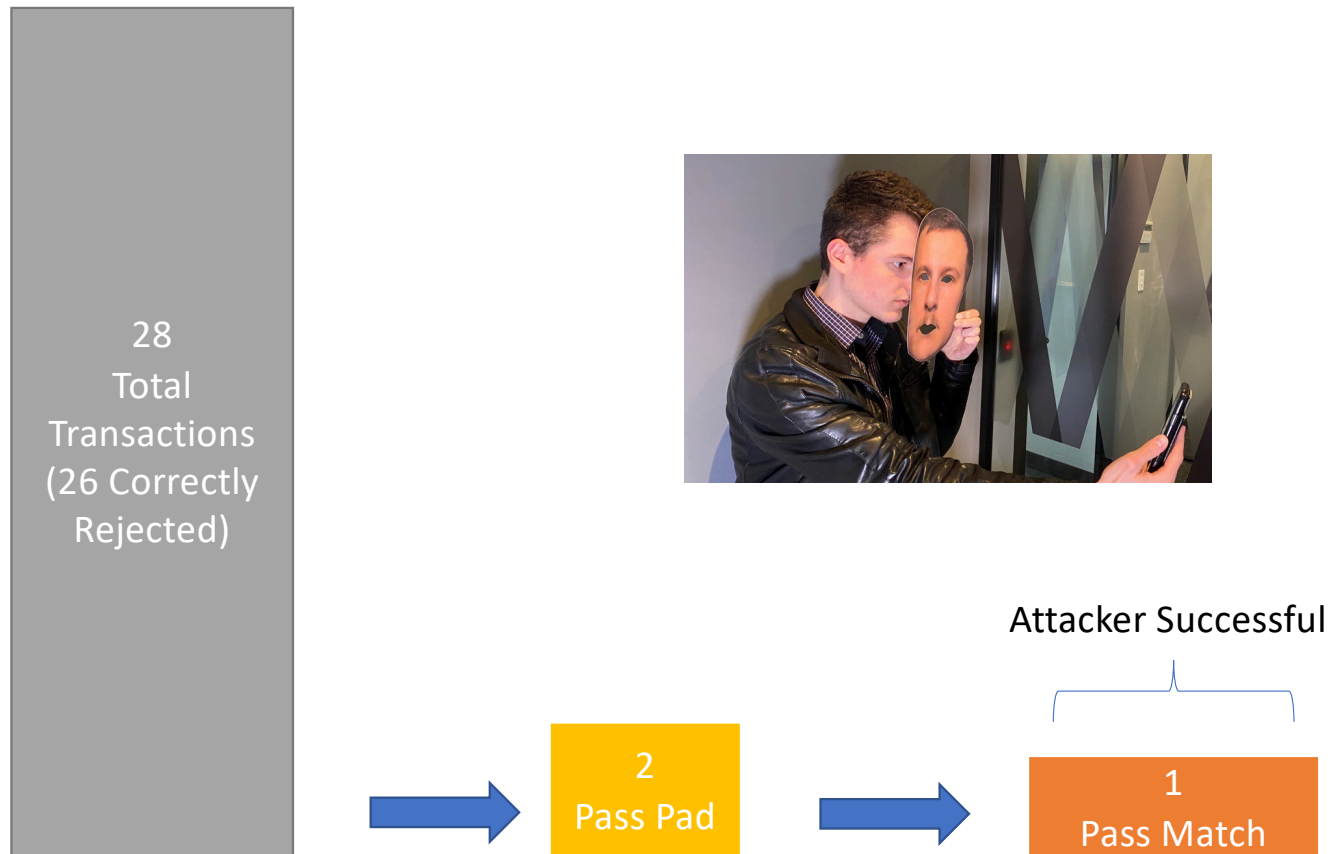
Scenario PAD Attacker Good Quality Transactions



Scenario Attacker Poor Quality Transactions

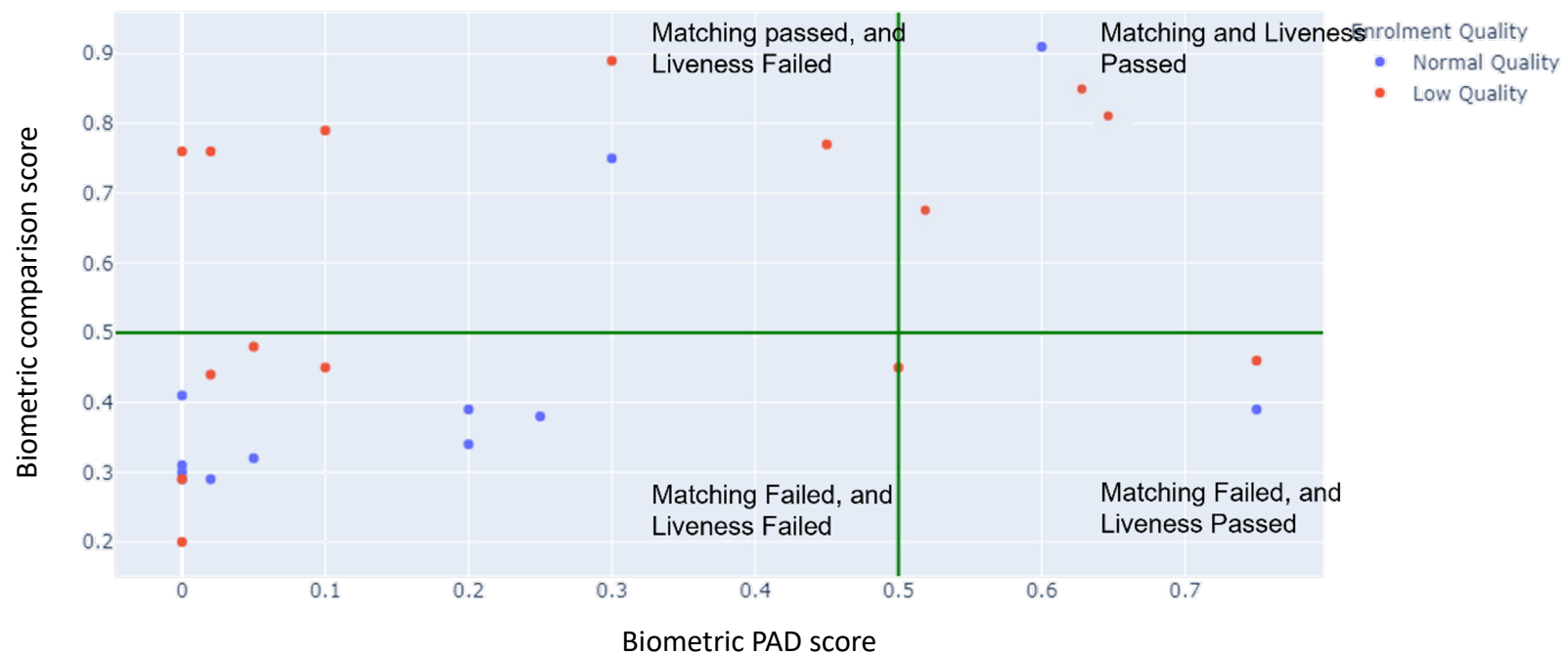


Scenario PAD Attacker Poor Quality Transactions



Distribution of biometric comparison scores and liveness scores for attack presentations

Distribution of scores for presentation attacks colored by enrolment image quality



Conclusions

Current Findings

- Poor quality in eIDV
 - Can increase the chance of higher non-mated scores for impostors
 - May result in attack instruments being more likely to be accepted
- More results from PAD are needed to draw high confidence conclusions
- Results depend on the system and the configuration
- Good quality control
 - is likely protective against attacks
 - and provides a good audit trail

Next Steps

- Enhanced PAD versus quality evaluation
 - Use of synthetic generated data for testing
 - Effectiveness of morphing using GAN faces
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- We have a new evaluation tool in beta test, reach out if your interested.
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