![CASRA]

Appropriately Assessing X-Ray Screening Competency: Challenges of Today and the Future

Slavtcho Groshev

Project Manager

November 16, 2017 - AVSEC World Training and Accreditation Workshop

Overview

› Introduction

› Technological Progress

› Level of Automation

› Determinants of Screener Performance

› The Purpose of Certification Tests

› Image Interpretation Competency

› Designing a Certification Test

› Designing a Certification Process: Best Practices
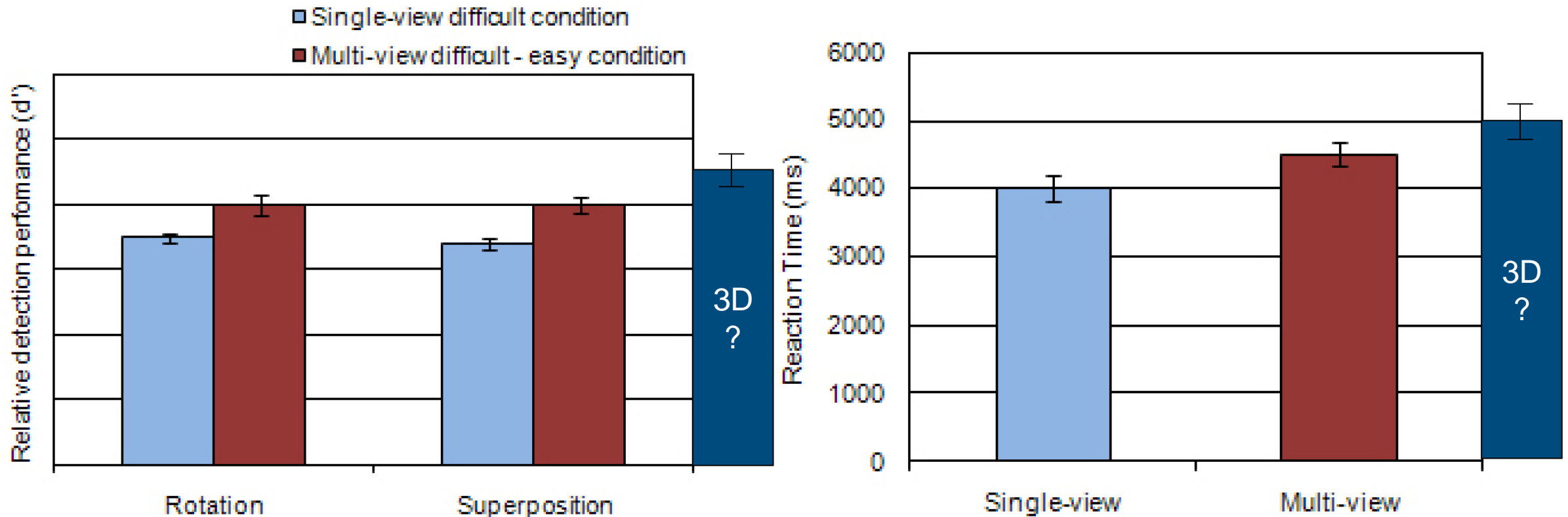
› Take Home Message

Introduction

❯ Security is a basic need.

❯ Sociotechnical systems enable it:
  ▪ Human
  ▪ Technology
  ▪ Organization

❯ Progress brings challenges and opportunities.
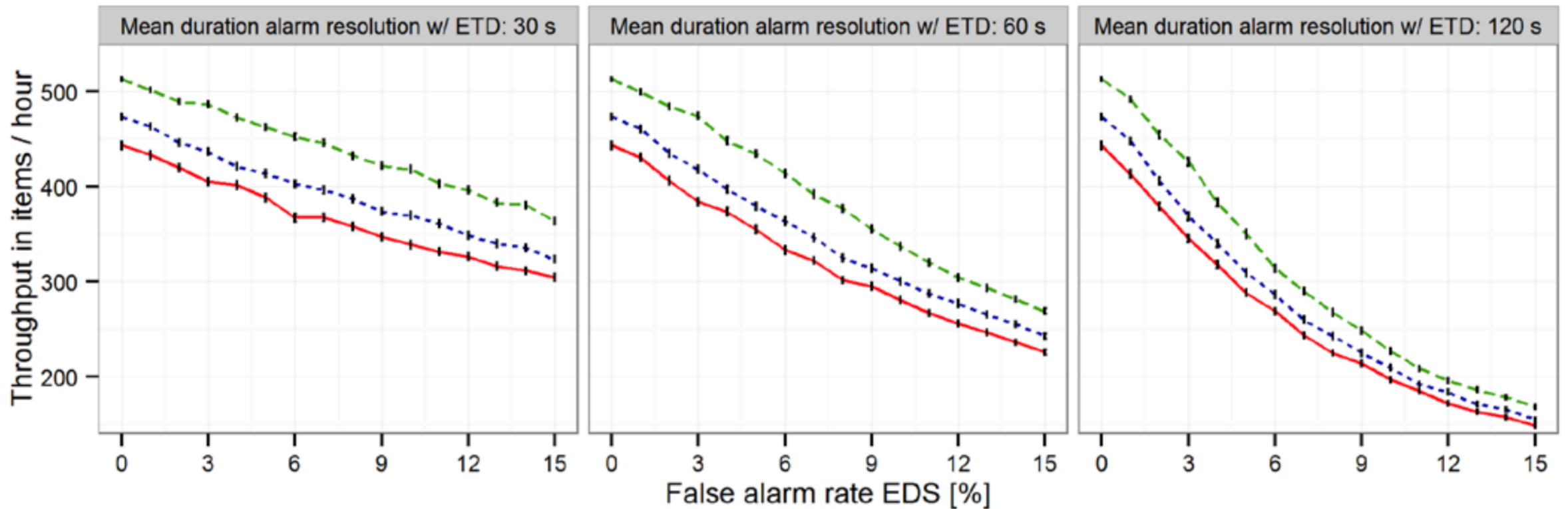
Technological Progress
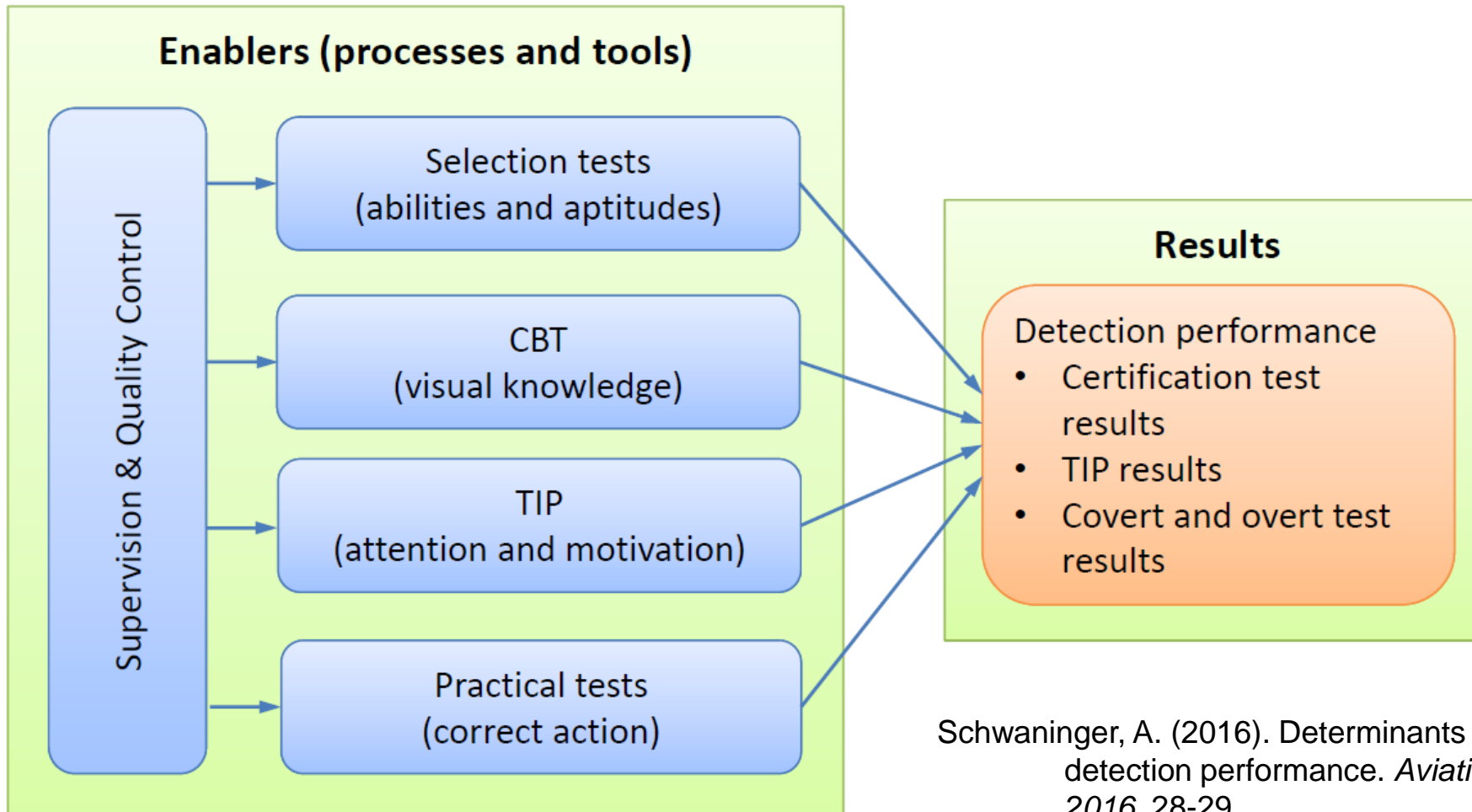
Technological Progress (Continued)

von Bastian, C., Schwaninger, A., & Michel, S. (2008). Do multi-view X-ray systems improve X-ray image interpretation in airport security screening? *Zeitschrift für Arbeitswissenschaft, 3*, 166-173.

Level of Automation

Sterchi, Y., & Schwaninger, A. (2015). A First Simulation on Optimizing EDS for Cabin Baggage Screening Regarding Throughput. *Proceedings of the 49th IEEE International Carnahan Conference on Security Technology, Taipei Taiwan, September 21-24, 2015*, 55-60.
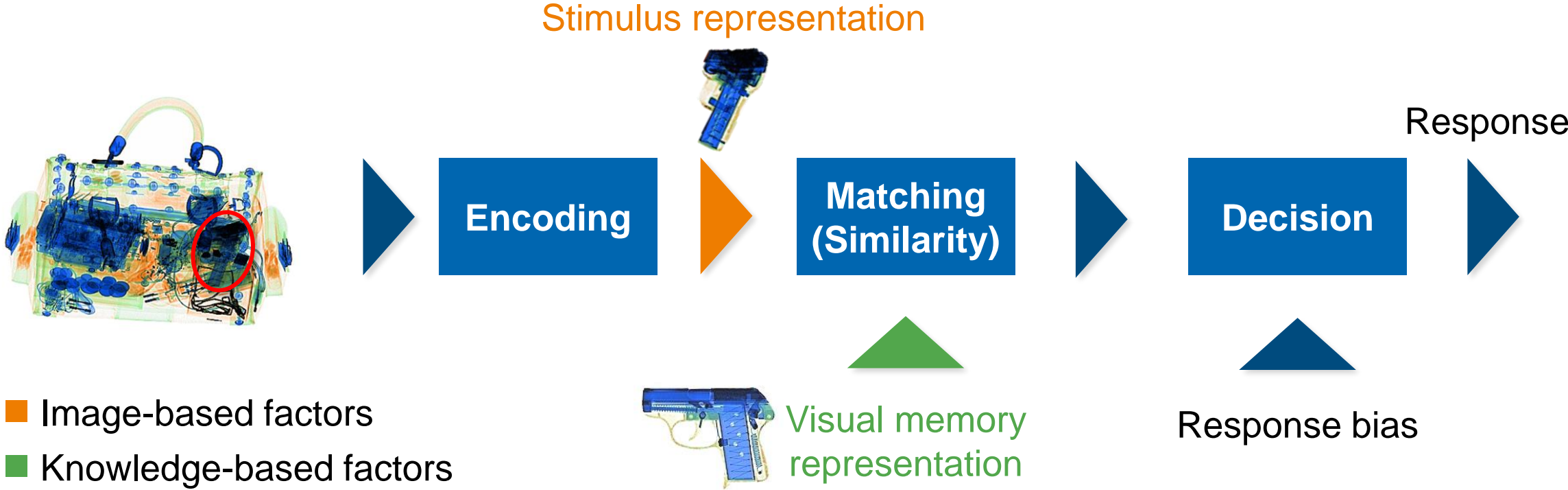
Determinants of Screener Performance

Schwaninger, A. (2016). Determinants of airport security X-ray screeners' detection performance. *Aviation Security International, August 2016*, 28-29.
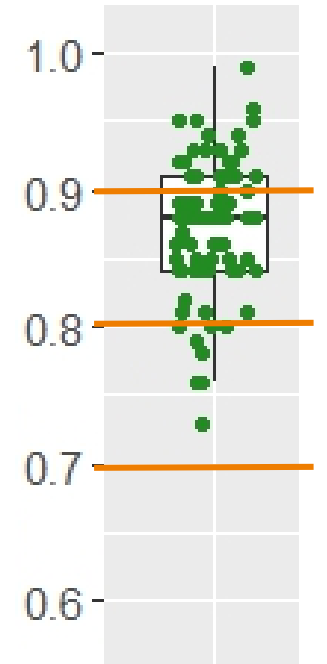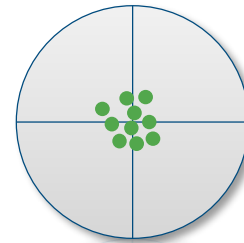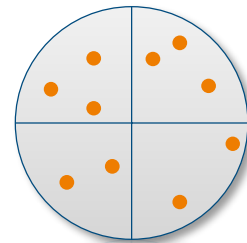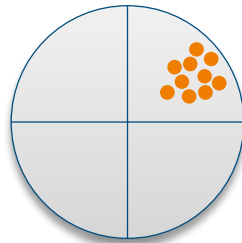
The Purpose of Certification Tests

Image Interpretation Competency

Stimulus representation

Response

- Image-based factors
- Knowledge-based factors

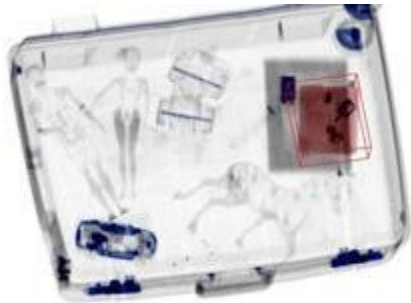Encoding → Matching (Similarity) → Decision → Response

Visual memory representation

Response bias

Schwaninger, A., Hardmeier, D., & Hofer, F. (2004). Measuring visual abilities and visual knowledge of aviation security screeners. *IEEE ICCST Proceedings, 38*, 258-264.
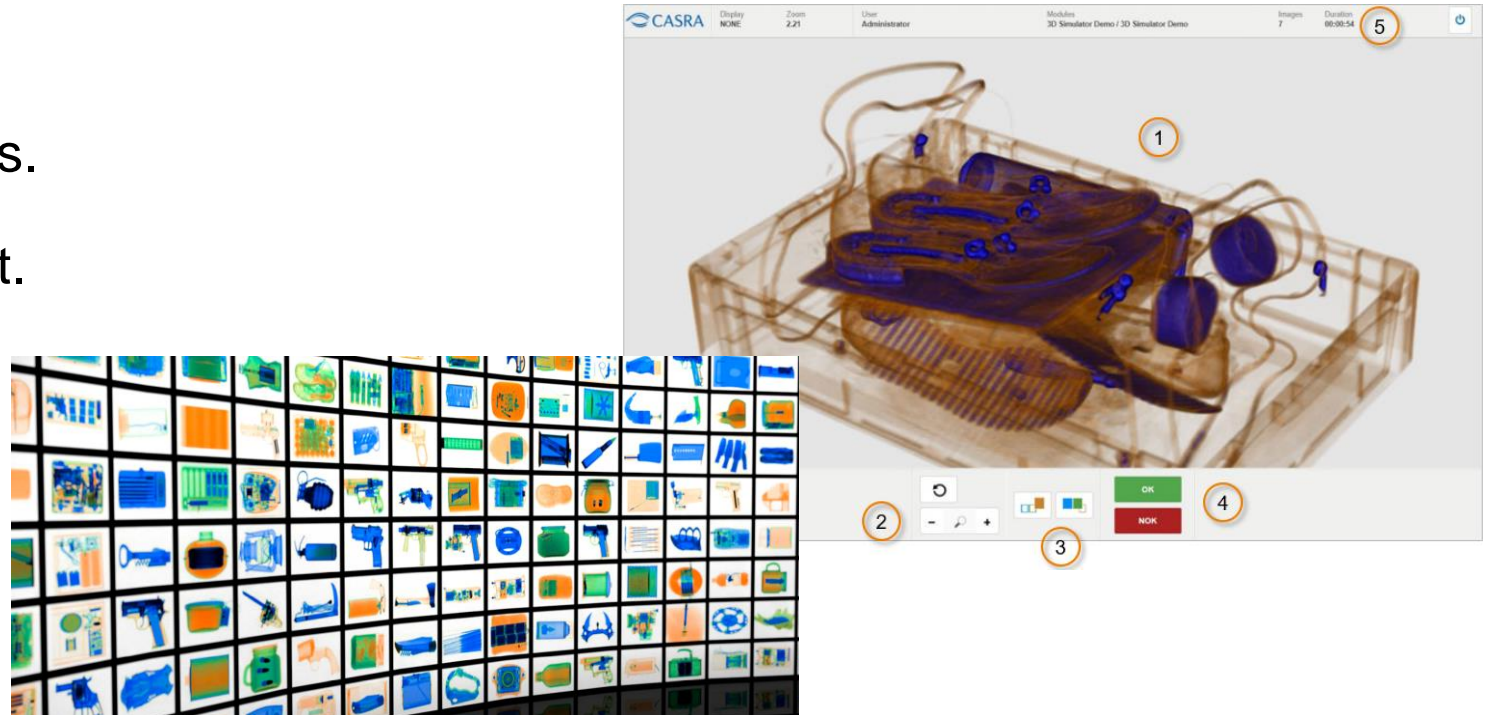
Designing a Certification Test

1. Determine what task has to be accomplished.

2. Ensure quality and fairness (reliability, validity, standardization).

3. Define appropriate pass marks (pilot study).

Schwaninger, A., Bridges, A., Drury, C., Durinckx, F., Durrant, P., Hodge, T., Hofer, F., Jongejan, R., Maguire, R., McClumpha, A., Neiderman, E., Steinmann, C., & Wüest, W. (2004). Principles and requirements for assessing X-ray image interpretation competency of aviation security screeners. *White Paper, International Aviation Security Human Factors Technical Advisory Group (InterTAG), Competency Assessment Working Group (CAWG).*

Designing a Certification Process: Best Practices

❯ Use computer-based tests.

❯ Harmonize the certification process.

❯ Periodically review the test content.

❯ Train the competencies you test.

PERSONNEL SELECTION ❯ **INITIAL TRAINING** ❯ **INITIAL CERTIFICATION** ❯ **RECURRENT TRAINING** ❯ **RECURRENT CERTIFICATION**

Take Home Message

❯ Humans are still crucial in aviation security.

❯ Progress and automation bring challenges and opportunities.

❯ Science and application must go hand in hand to tackle them.

❯ Performance assessment should be viewed from a system perspective.

Thank you for your attention