Summary and Next Steps

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- Consensus that the work addresses important problems; many possible future directions of interest
- Technical observations:
  - Deep learning seems the preferred approach to detection of persons, objects, object parts
    - Can use pretrained off-the-shelf networks productively with minimal (or even no) retraining
    - Some form of pose or hand detection required
    - Deep networks also used to provide features for tracking – low real-time compute cost
  - Object level tracking exploits known techniques
    - Kalman filtering, multi-hypothesis-tracking, frame tracking
    - May be used to reduce frame rates
  - Association and event detection techniques work, but more needed to address complex events
    - Relation with Casino and Retail video analytics is strong, but unclear how to connect researchers to industry
- Challenges
  - How to use this for enabling risk-based screening – Maintaining passenger identity over time, checkpoint activities
  - Message better: extend to other missions: enhancing automation, increasing security
  - Families, groups, TSO interactions – how to detect groups, avoid unnecessary false alarms
  - Event complexity – more objects in bins, more events, passenger appearance changes, …
  - Integration of other sensors – depth cameras, other modalities, …
  - Identify showstoppers: frame rate? View angle? Coverage?
  - Real-time operation, display to operators, CONOPS, Stakeholder opinions (passengers, TSOs, …)
  - Robustness to real world – changes in light, height, camera viewpoints, …
- Next step: enhance TRL → real-world data from airports (TSA R&D in Las Vegas, other airports (BOS),…)