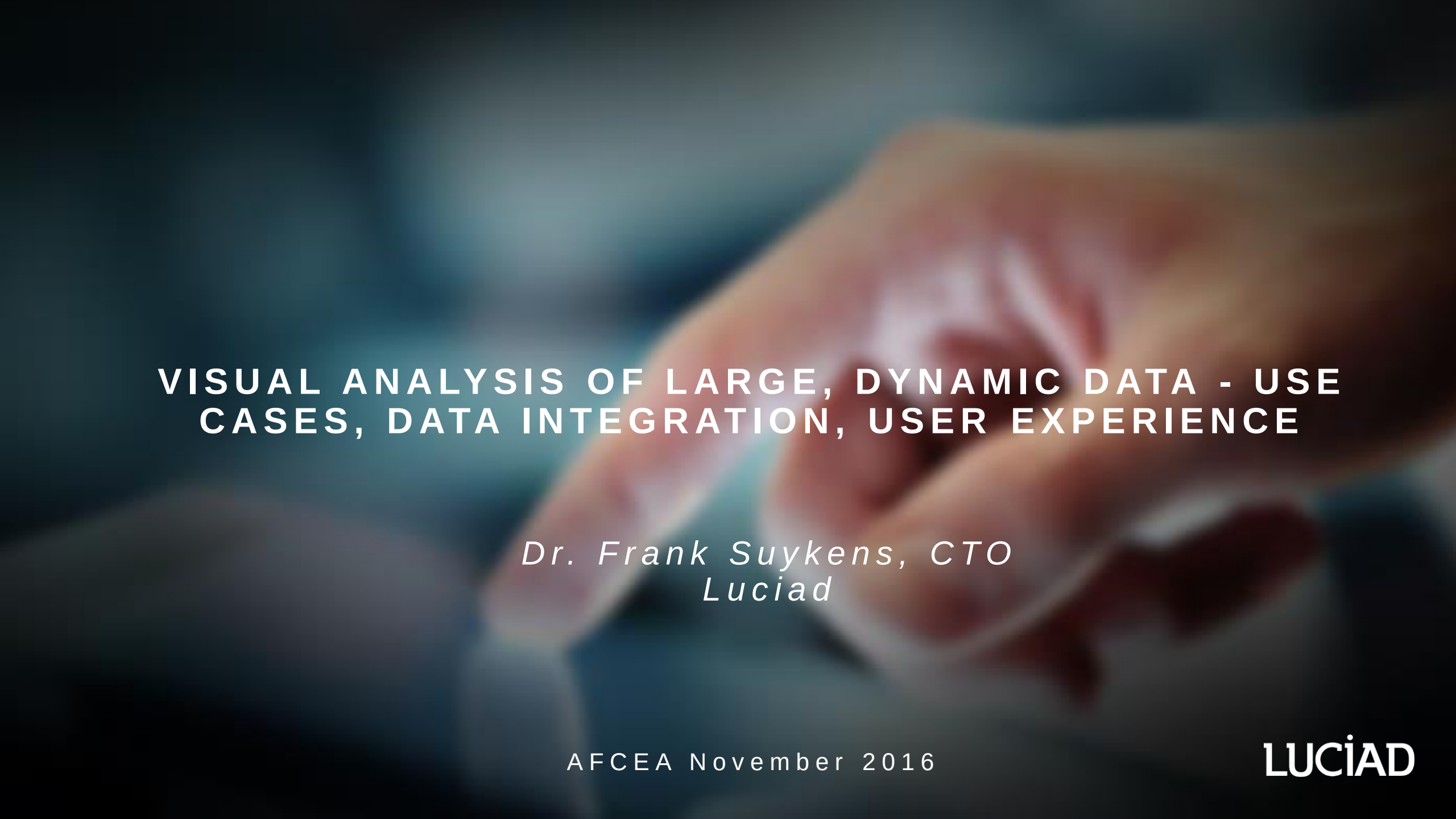

VISUAL ANALYSIS OF LARGE, DYNAMIC DATA - USE CASES, DATA INTEGRATION, USER EXPERIENCE

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Luciad

AFCEA November 2016

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We build **software components**
that allow third parties to create
geospatial situational awareness &
visual analytics applications

SITUATIONAL AWARENESS

→ Situational Awareness (SA) involves **being aware of what is happening** in the vicinity to **understand** how information, events, and one's own actions will **impact** goals and objectives, both **immediately and in the near future**. [Wikipedia]

VISUAL ANALYTICS

→ Visual analytics is the science of **analytical reasoning** facilitated by **interactive visual interfaces**. [DHS]

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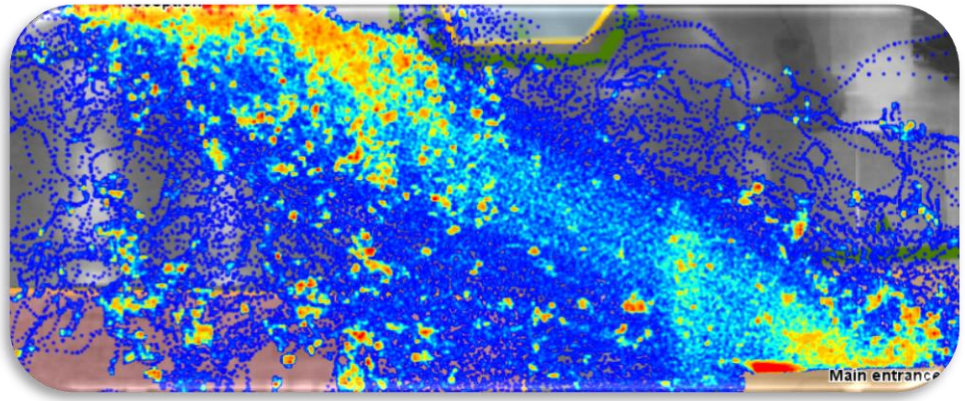
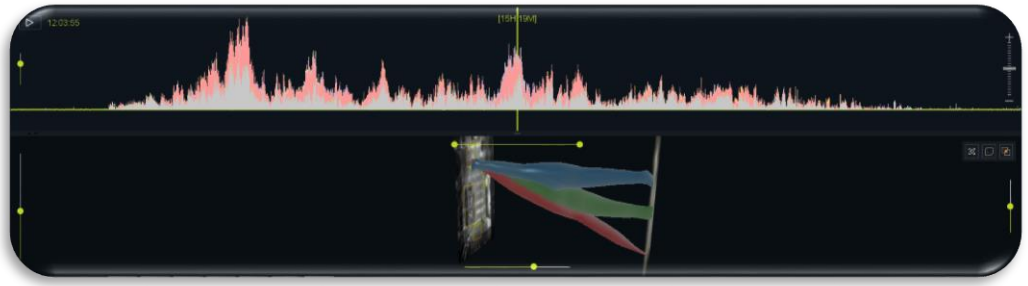
EXAMPLE – PEOPLE FLOW ANALYSIS





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INTEGRATION CHALLENGES

→Data Integration

→System integration

→User Integration

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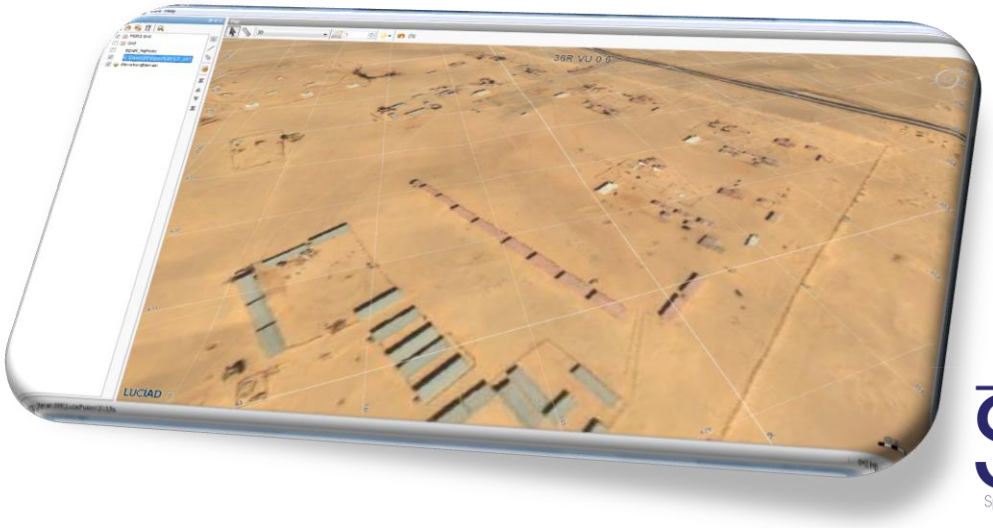
DATA INTEGRATION CHALLENGES

→Google Earth Enterprise

- End-of-life
- Large imagery globes in use
- High performance 3D client + strong KML support
- Tech replacement



→Integration options

- Read GEE globes directly
- Process new data into tile pyramids
- Generate tiles on the fly from source data
  - Only 1% of tiles actually being looked at…
  - Faster updates of data possible
- Open standards (OGC, …)

SOS
Special Operations Solutions

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DATA INTEGRATION CHALLENGES

→**Real-time video data**

- UAV missions (XTEK, Boeing, Airbus, …)
- Live video
- In the field
- Context data needed

→Integration solution

- Standards
  - Standards (STANAG 4609)
  - Combine COTS (H264, …)
- Performance
  - Direct ingest of video
  - Stream to GPU
  - GPU-based video orthorectification to combine with other geo data and terrain

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SYSTEM INTEGRATION CHALLENGES

→**Finnish Defense Forces**

- Multiple systems
- Core + Addons
- Multiple SIs
- Multiple Luciad product versions in use

→Integration solution

- Stable Component APIs
- Binary backwards compatibility
- Standards compliant

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SYSTEM INTEGRATION CHALLENGES

→Systematic Frontline

- Full application on mem-stick
  - Mission planning, terrain analysis, defense data formats, …
  - Mission execution in vehicle
  - Switch vehicles

→Integration solution

- Same product as people movement app to have all functionality
- Small footprint
  - Modular components
  - Shrink code base
  - Tune caching strategies

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USER INTEGRATION CHALLENGES

→NATO LogFS

- Users don’t have time
- Users don’t have patience (Digital generation)
- Multiple applications
- Browser solution

→Solution approach

- Simple
  - NATO Style guide
  - Common L&F across applications
- Interactive at all times
  - Asynchronous
  - High performance
  - Fast data architecture (caching, …)

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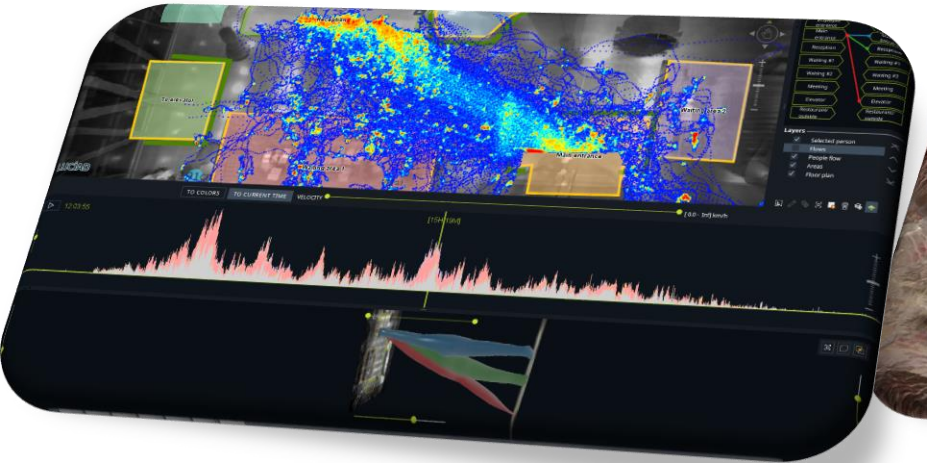
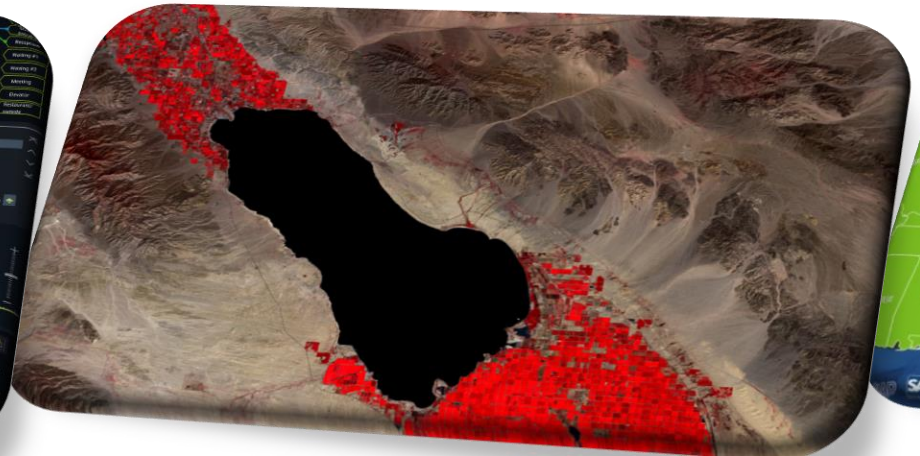
USER INTEGRATION CHALLENGES

→Visual analytics
- Time!
- Interactive analysis
- Large data backends

→Solution approach
- Connected views (time, 3D, …)
- Distributed filtering/aggregation
  - on GPU
  - in-memory (CPU)
  - on server
  - on big data back-end





VISION ON INTEGRATION

→The Death of ETL

→Components first, standards first as well

→Time is the most important dimension of geospatial data

→GPU becomes part of architecture

→Simple, beau et efficace

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THANK YOU!

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