CCTV Research update

Do we need Human Factors guidelines ?

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CCTV Update

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- **Why research ?**

- **Results - Copenhagen IEA/NES conference**
  - overview of papers

- **Current research**
  - WP 1: "scenes", measure for CCTV operator workload
  - WP 2: laboratory experiments
  - WP 3: CCTV in oil & gas, revised guidelines
  - other: wide angle camera lenses

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Why research ?

- Practice: bad image quality
  - sharpness, resolution, distortion, viewing distance
  - lack of engineering guidance
- Goal: understand the HF of CCTV-systems
- Product: HF guidelines document

Why research ?

- few guidelines, little *evidence*
  - remote control, off-shore, healthcare, etc.

- theory ≠ practice
  - theory: max 9 -12 camera's

  - practice: operators like -->

- digital replaces analogue
  - think pixels

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Research project - '12/'13

- Presented earlier at HFC-meeting / 4 phases:
  - 1 – Orientation - literature survey (2012)
  - 2 – Case studies (8 cases)
  - 3 – Pilot experiments - image perception
  - 4 – Draft Guidelines

  - 13 funding partners
  - 4 research partners

- Application areas
  - security, surveillance
  - traffic
  - remote control

IEA/NES Conference

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- **Symposium goals**
  - inventory: what we know ….
    …. and what we do not know….
  - 4 (of 9) papers are based on the research project
  - discuss state-of-the-art and a way forward

- Published papers
  - symposium overview paper by Pikaar, Lenior
  - for .pdf copies of all papers ask Stig or Ruud.

- **Next - short overview of papers**

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Literature & cases

- Supervision or surveillance – what's in a name?
  - Schreibers et.al.

- literature: > 40 references
  - mainly traffic, surveillance (security)
  - analogue/conventional systems

- guidelines found: "open" doors

- Most interesting guideline (usa - traffic)
  - use video less, use sensor data instead!
  - hence: combination of different types of data.

Literature & cases

- 8 Case studies - systematic task analysis

  - Remote control
    - External trigger (message, alarm, communication)

  - Surveillance & Security
    - tasks: monitor, detect, recognize, and identify
    - no external trigger

DETECT	OBSERVE	RECOGNISE	IDENTIFY
10%	25%	50%	100%

Case study – traffic control

- Comparing 2 types of video walls
  - by Schreiber, Bouchier

- Image quality:
  - Objective measures, best: left
  - Subjective measures: right

Research papers

- CCTV - Human Factors Challenges
  - *by: John Wood (UK)*

  - Image complexity
  - Contrast (day, night)
  - Field experiments.

Pilot experiments

- Mediated vs non-mediated observation
  - *by: Landman, Bennis, & Lenior*

- *CCTV versus direct observation*
- validity of test charts
- perceived image quality

Landolt - acuity test   Vidilabs test chart   Rotakin

Other papers

- Case - how to sell a room without a view ?
  - *Remote lock & bridge control*
  - *Consequences of user participation*

- CCTV and remote operations of oil and gas fields
  - *Safety issues*
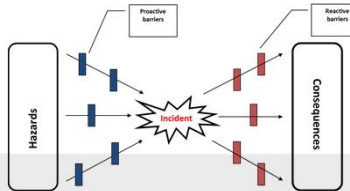 - *Stig Johnsen, Trine Stene*

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Other papers

- CCTV and remote operations of oil and gas fields
  - Vigilance decreases over time – need for alarms in CCTV?
  - Missing use of Human Factors standards even when 70-200 CCTV used
  - Need CCTV design based on safety perspective :
    Proactivity: signals in advance of an undesired event;
    Reactive: To minimize consequences and recover;
    Learning: After the fact

Draft HF Guidelines

- ISO 11064 – structure / systems approach

- Chapters
  1. Project Ergonomics (= HF engineering process)
     completed
  2. System characteristics (= define system)
     completed
  3. Tasks and jobs
     available, except task allocation/workload indicators
  4. Control centre layout & workplace design
     available, except full details of cctv hardware
  5. Image presentation and interaction design
     available, mostly not evidenced

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Research 2014

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- WP 1 - Concept of "Scene"
  - # of images = not a measure for workload

  - related "camera images" --> 1 scene
    - logical and meaningful set of visual information, to be monitored with a specific aim

  - # of scenes: better estimate for workload ?

  - check in case studies

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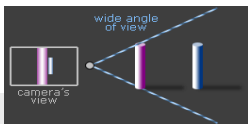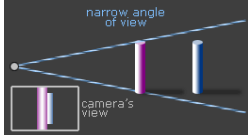
Research 2014

- Lenses: wide angle (angle > 55°) versus standard
  - lens quality (light distribution)
  - edge distortion
  - barrel distortion

narrow angle
of view

camera's
view

wide angle
of view

camera's
view

- risk misinterpretation
  - estimate distance

Research 2014

- WP 3 - Revise Guidelines
  - New work item for ISO 11064

- Feed back on Draft Guidelines

- A special case: remote supervision in oil & gas
  - Not yet in Norsok standards
  - work in progress: 4 in-depth stakeholder interviews
  - Stig Johnsen / Sintef

WP 3 – Revise Guidelines

- Large difference between
  - surveillance & security versus other applications
  - question: one general guideline or ...dedicated guidelines?
  - question: in industry CCTV is telecom ?
    how to reach engineers ?

- Application specific: tasks
  - CCTV requirements: what you need to see?

- Review Draft Document
  - leave your business card
  - receive Draft & List of considerations for review

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Way forward .....

- Report by the end of 2014
- Presentation by interactive sessions
  - one-day workshop

- As all HF: **we need to keep on explaining!**

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