Background: analog-hole problem

Conventional problem
- Originally intended to resolve security problems with analog-output terminals of digital equipment
- Resolution by replacement of digital terminals

Rise of new problem exploiting monitors and screens
- Trend of increasingly high-quality monitors and cameras makes it easy to reshoot presented content -> Distribution of illegally re-shot content
  Ex. re-shoot PC monitors with cell-phone cameras -> upload shot content
  Ex. re-shoot theater screens -> sell pirate DVDs
- Loss of USD 3B per year (survey of Motion Picture Association of America)

Conventional measures against re-shooting: use of digital watermarks
- Embed theater ID WM into digital cinema film
- Detect WMs in pirate DVDs and identify flow of illegal distribution
  But: no control of re-shooting

Re-shooting countermeasures based on difference between sensory perceptions of humans and devices

Objective
- Establish countermeasure to stop re-shooting
  No new function is added into existing user-side device (ex. cam)

Approach
- Use of difference between sensory perceptions of humans and devices
  - Destroy shot content using invisible signals which add noise to content shot through CCD/CMOS devices
  - Near-infrared signals: CCD and CMOS react to them