

# Effects of 3D display characteristics on visual perception and on 3D Image Safety

**Hiroyasu Ujike, Hiroshi Watanabe**

**Human Technology Research Institute**

**AIST**



National Institute of  
Advanced Industrial Science  
and Technology  
**AIST**

collaborated with

Paul Boynton (NIST)

John Penczek (NIST)

# 3D Image Safety

## 3D Image Safety

Purpose:

To provide and promote an environment in which viewers can enjoy the benefits of stereoscopic images without adverse effects, such as 3D visual fatigue and 3D motion sickness.



International Standardization



Quality control

Image safety

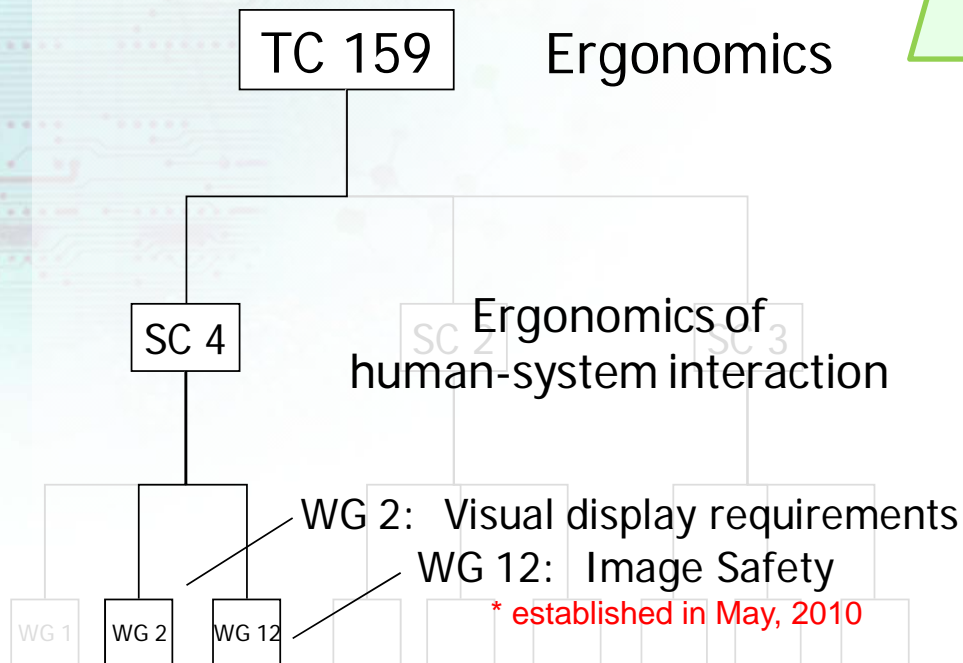
Reducing **visual fatigue** and  
**motion sickness** in 3D images

Biomedical  
characteristics

Device  
characteristics

# Researches and standardization

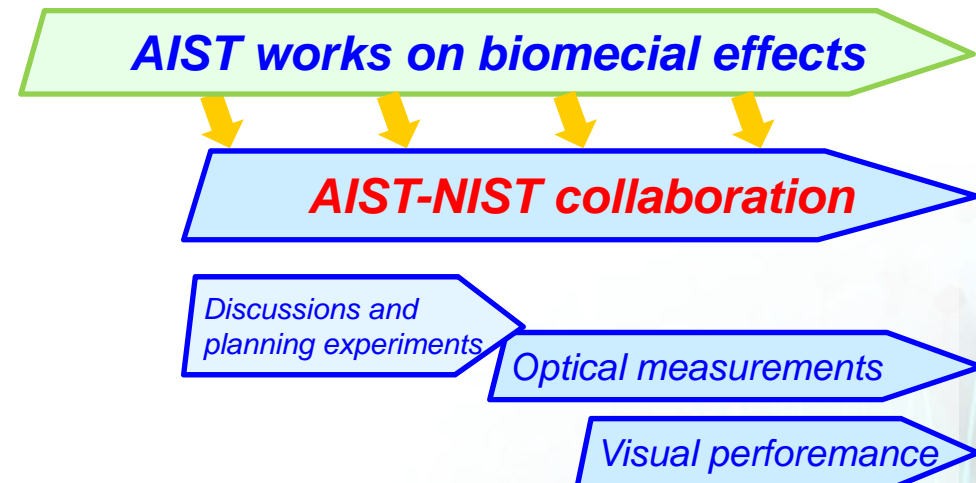
ISO technical committee  
discussing 3D Image Safety



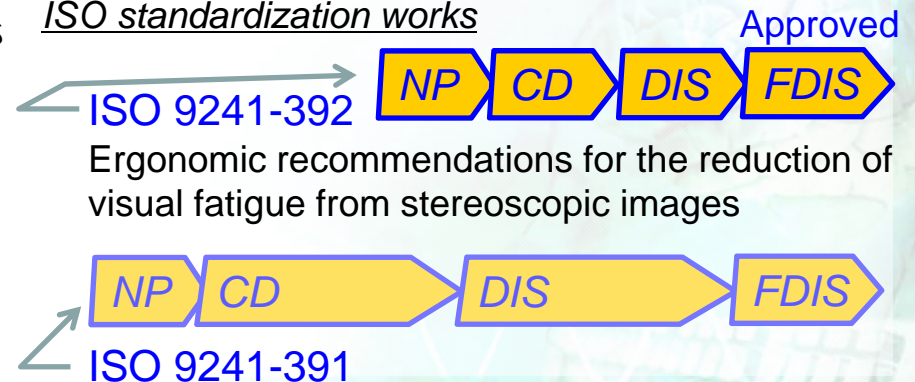
\*WG 2 has been standardizing requirements for displays including FPD in ISO 9241-300 subseries.

FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014
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Scientific researches

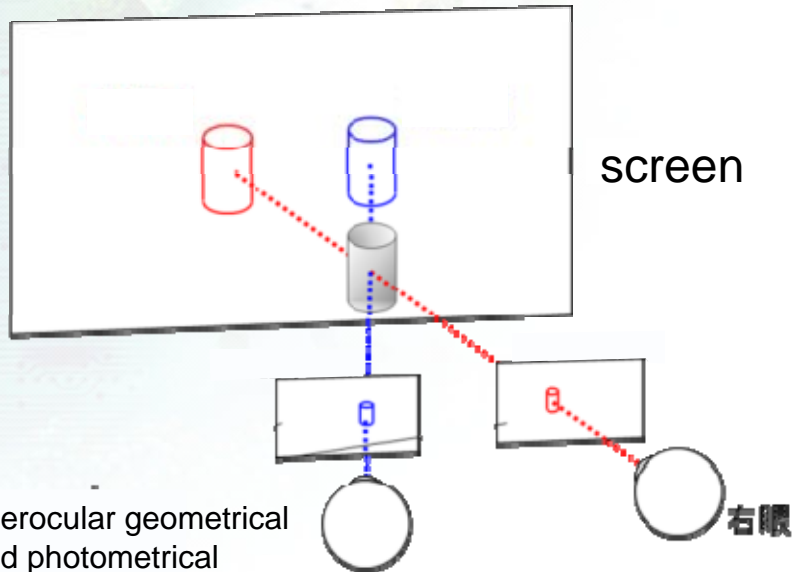


ISO standardization works



# Researches on biomedical effects

## Interocular differences



Interocular geometrical and photometrical differences, and Interocular crosstalk

Making clear the relations between physical parameters and visual fatigue

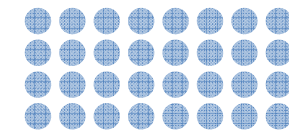
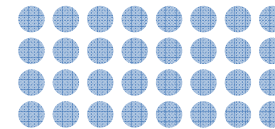
- visual performance
- comfortability

AIST-NIST  
collaboration

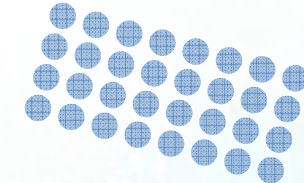
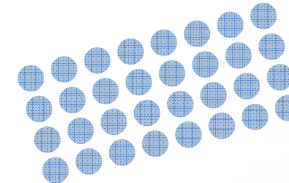
Left eye image

Right eye image

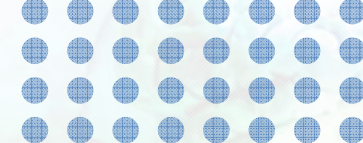
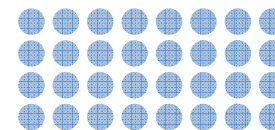
Vertical misalignment



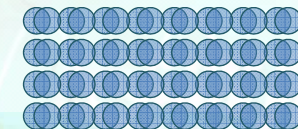
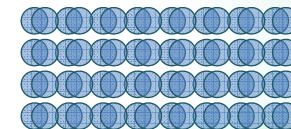
Rotational misalignment



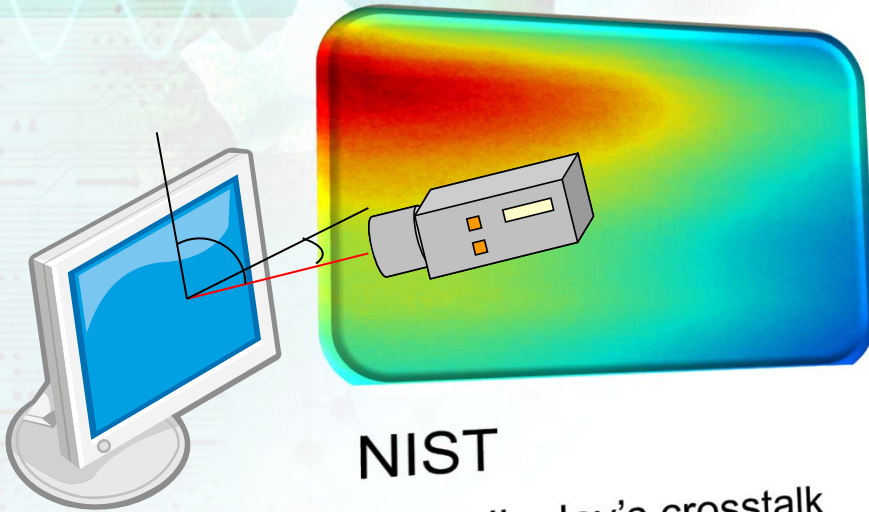
Magnification difference



Interocular crosstalk

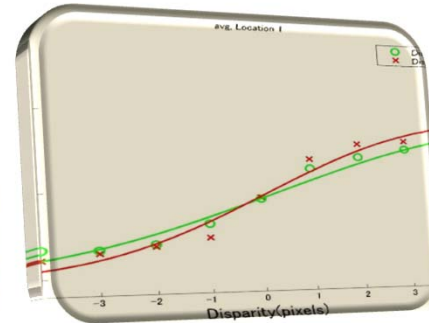


# Collaboration: NIST and AIST in this project period



**NIST**

- 3D display's crosstalk



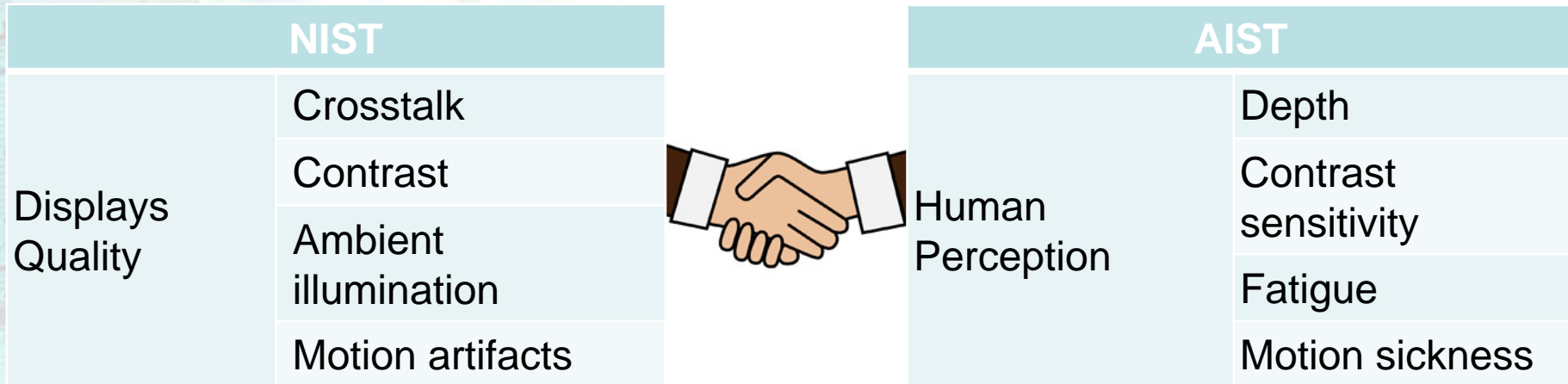
**AIST**

- Human depth perception



Background data for ISO  
Document

# Collaboration: NIST and AIST in the future



**HMD, VR, AR-Glasses, 4K/8K**

# Summary

1. On the issue of 3D Image Safety, AIST and NIST has been collaborated from each of their view points, such as biomedical effects and device characteristics, respectively.
2. International standardization on 3D Image Safety has been done in the relevant working groups, in which both AIST and NIST participate, in ISO.
3. Further collaboration is necessary, especially on the innovatively developing display technologies.



# Acknowledgement

We greatly appreciate the promotion of the Ministry of Economy, Trade and Industry in Japan on this project.

We sincerely appreciate the collaborative supports of both AIST and NIST.