

# Yoshiaki Maeda

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## Research Statement

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### Projection-based Extended Reality

The field of XR, which encompasses technologies such as augmented reality (AR) and virtual reality (VR) that closely integrate atoms and bits, is expected to find applications not only in entertainment but also across a wide range of industries, including medicine, education, design support, and remote communication. Within this field, my research focuses on projection mapping, a projection-based XR technology that enables users to experience virtual imagery in the real world without wearing special devices such as head-mounted displays (HMDs). I also have expertise in color science, which investigates human color perception, and I am working to clarify how the color of displayed images affects XR experiences. Through projection mapping, I aim to realize the ultimate display that achieves perceptual realism, a state in which virtual imagery becomes indistinguishable from real objects.

## Education

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**The University of Osaka**, Department of Systems Innovation, Division of Systems Science and Applied Informatics, Graduate School of Engineering Science

Toyonaka, Osaka, Japan  
Apr 2025 – present

- Iwai Laboratory, XR Group.
- Selected as a student in the Humanware Innovation Program.

**The University of Osaka**, Engineering Science

Toyonaka, Osaka, Japan  
Apr 2021 – Mar 2025

## Experience

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**The University of Osaka**, Research Assistant

Osaka, Japan  
Dec 2025 – Mar 2026

**Humanware Innovation Program, Osaka University**, Student

Osaka, Japan  
Apr 2025 – present

**Iwai Laboratory, Graduate School of Engineering Science, The University of Osaka**, Graduate Student Researcher

Toyonaka, Osaka, Japan  
Apr 2025 – present

Projection mapping, extended reality, color science, and computational imaging.

- Developed projector radiometric compensation methods using spectral imaging and differentiable optimization.
- Studied projector color compensation with hyperspectral cameras and 2D spectroradiometers.
- Evaluated compensation quality with spectral error metrics and perceptual color-difference measures.

## Teaching

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**Teaching Assistant:** The University of Osaka, Osaka, Japan (2025-04 - Present)

## Publications

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### Projector radiometric compensation using a 2D spectroradiometer

Yoshiaki Maeda, Daisuke Iwai  
[doi.org/10.1364/OE.596052](https://doi.org/10.1364/OE.596052)

### Projector color compensation via CIELAB color-difference minimization using spectral images / スペクトル画像を用いた CIELAB 色差最小化によるプロジェクタ色補償

Yoshiaki Maeda, Daisuke Iwai  
IPSJ SIG-CVIM Technical Report, 244th Meeting (CVIM)

### Perceptual evaluation of projector color compensation with a hyperspectral camera through a user study / ハイパースペクトルカメラを用いたプロジェクタ色補償のユーザ調査による色知覚評価

Yoshiaki Maeda, Daisuke Iwai

Proceedings of the 30th Annual Conference of the Virtual Reality Society of Japan, 2E2-03

**Projector color compensation by spectral-image error minimization using gradient descent / 最急降下法を用いたスペクトル画像誤差最小化によるプロジェクタ色補償**

Yoshiaki Maeda, Daisuke Iwai

MIRU 2025, IS3-201:1-IS3-201:5

**Projector Color Compensation with a Hyperspectral Camera**

Yoshiaki Maeda, Kosuke Sato, Daisuke Iwai

[doi.org/10.11509/sci.SCI25.0\\_440](https://doi.org/10.11509/sci.SCI25.0_440) 

## Projects

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**Projector radiometric compensation using a 2D spectroradiometer**

A projector radiometric compensation method that minimizes color differences between a target image and the projected result using a 2D spectroradiometer. The project models the color transformation between a projector and a 2D spectroradiometer in a differentiable manner and compares spectral-error and perceptual color-difference objectives.

## Skills

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**Research Areas**

Mixed Reality, Projection Mapping, Projector-Camera Systems, Color Science, Computational Imaging.

**Methods**

Radiometric Compensation, Spectral Imaging, Hyperspectral Imaging, 2D Spectroradiometry, Numerical Optimization, Perceptual Color Difference.

## Academic Interests

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**Projection-based Extended Reality**

Spatial Augmented Reality, Projector Color Compensation, Human Color Perception, Computer Vision.