CS 888, Winter 2010

Advanced topics in computer graphics

Digital and computational photography

Craig S. Kaplan, William Cowan, Stephen Mann

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Mondays 2:30–“5:20”, RCH 205

Craig S. Kaplan, csk@uwaterloo.ca

http://www.cgl.uwaterloo.ca/~csk/cs888/wi2010/

A seminar course—primarily paper reading and discussion

Why?

- Learn about a new topic
- Catch up with exciting new research, get ideas for new work
- Practice reading papers, preparing and giving talks

Components

15%	Participation (attendance and discussion)
5%	Short presentation / activity
32%	Presentation
8%	Write-up
40%	Final project

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8%	Writ
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24/32: just a recitation of the paper
28/32: Some attempt at synthesis and critique
32/32: Good critique with useful insights

Components

Audit

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5%	Short presentation / activity
32%	Presentation
8%	Write-up
40%	Final project

...don't just sit in

The short presentation

Discuss a photograph (or small set), and the artistic and technological principles that underlie it.

Discuss a trick or technique from traditional or digital photography.

Show a photograph (or small set) that demonstrate an interesting principle.

...to be determined

Choosing a paper

Select a recent research paper, or *at most* two interconnected papers. Everyone will read this.

Track down other important sources, related and prior work.

Conferences and journals in computer graphics and computer vision.

The presentation

Establish a context for the paper. What's the general problem area, and why do we care?

Why is it interesting? Why is it deep?

What's the big idea of the paper?

Discuss and criticise results; talk about strengths and weaknesses

Identify opportunities for future work

Do not merely present the technical details of the paper!

The write-up

A one-page overview of the paper.

2/3: summary

1/3: critique

Circulated to the class the Friday before the presentation.

The project

Usually a small implementation, possibly including original ideas.

Or a short research paper (in the manner of a PhD second stage report or a research proposal).

Looking for synthesis and insight.

The tech report

Presentation write-ups and projects will be collected into a technical report.

Overview

Digital and computational photography

Techniques for producing new photographic content (or metadata) from existing photographs

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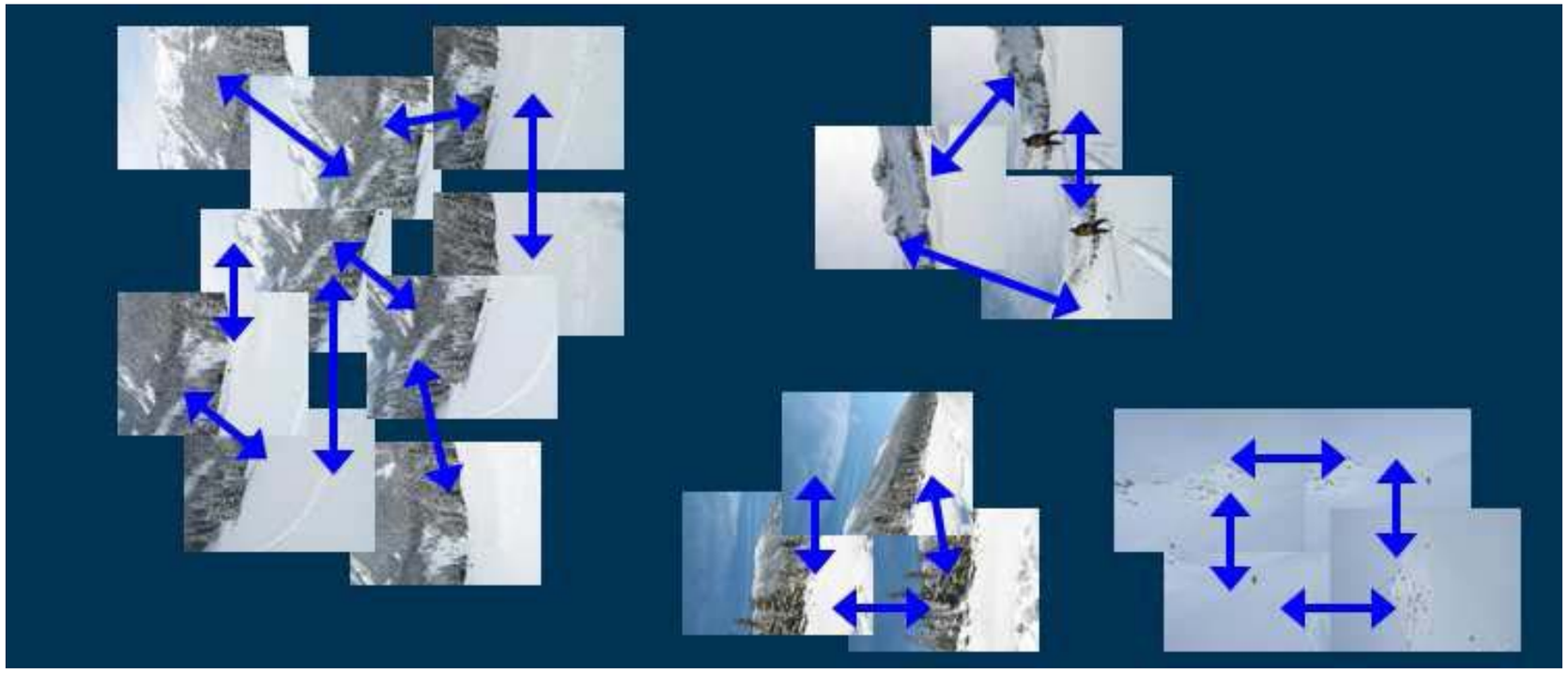
Techniques for producing new photographic content (or metadata) from existing photographs

Not...

... Image understanding (e.g., face recognition)
... Image synthesis (e.g., ray tracing)
... Non-photorealistic rendering (e.g., paint simulation)
... Image-based rendering (e.g., reconstruction)
...video

Stitching

Panoramic Stitching



Scratch removal, editing, etc.

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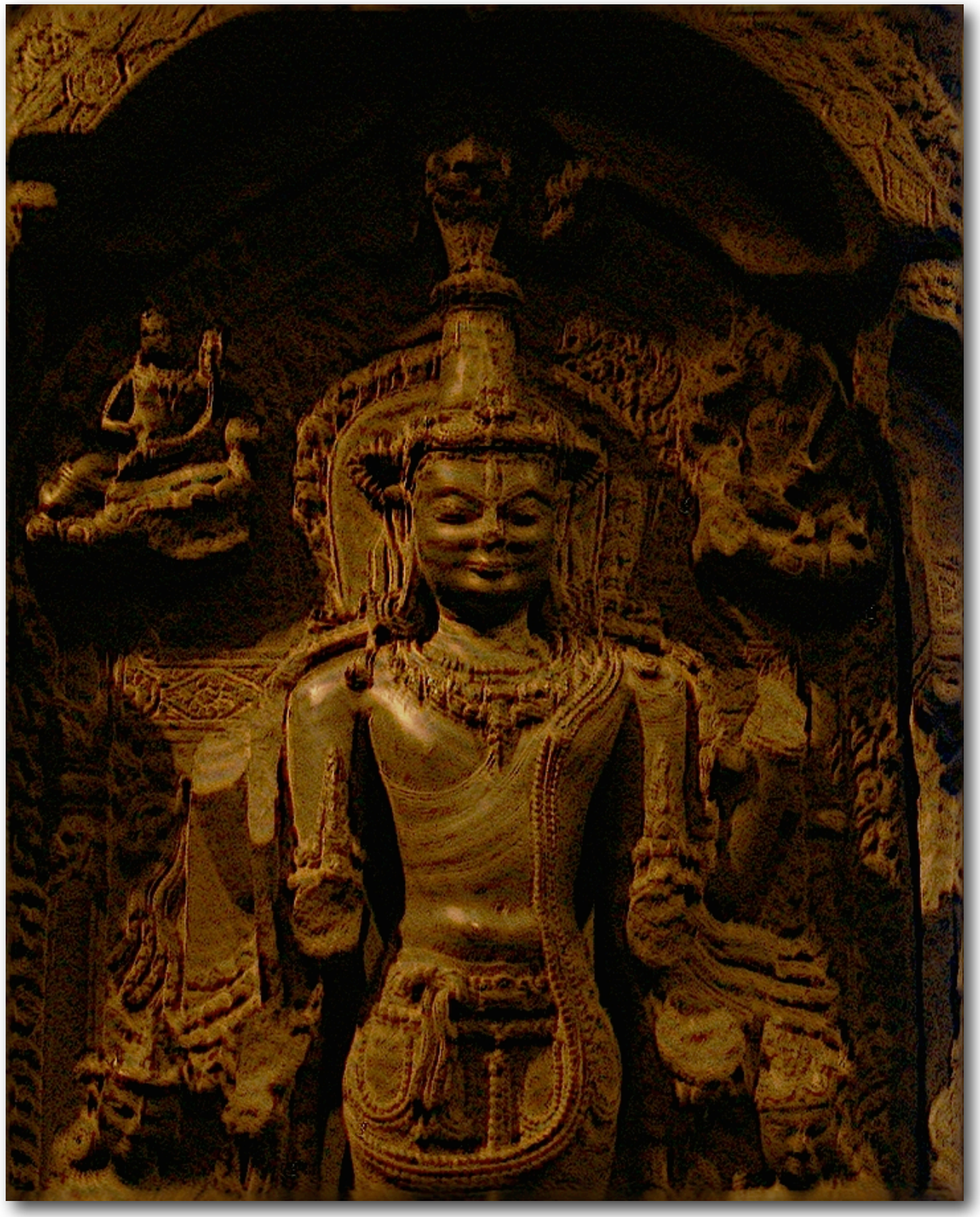
Large image libraries as sources

Large image libraries as sources

Noise/blur removal



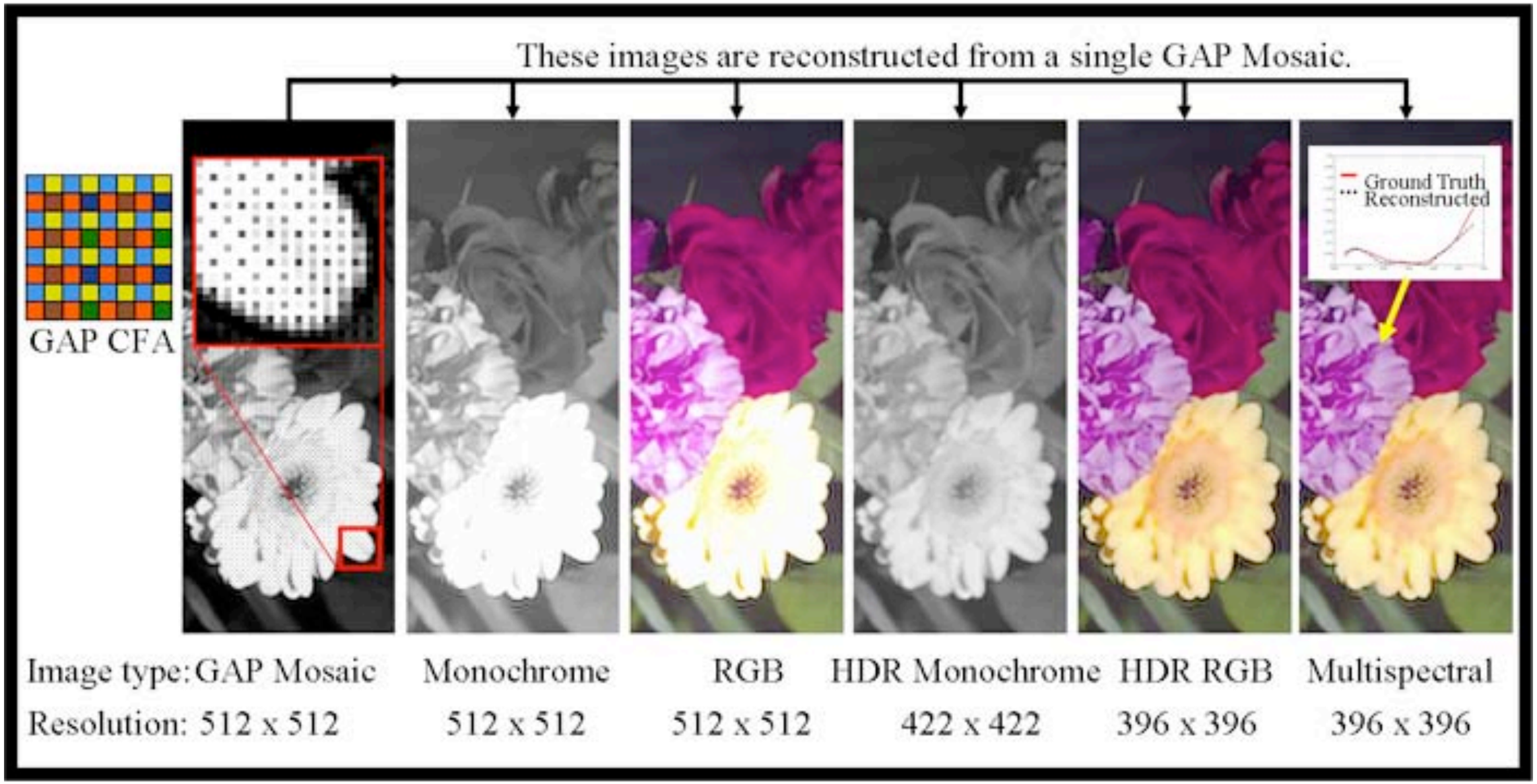
HDR Photography


HYATT

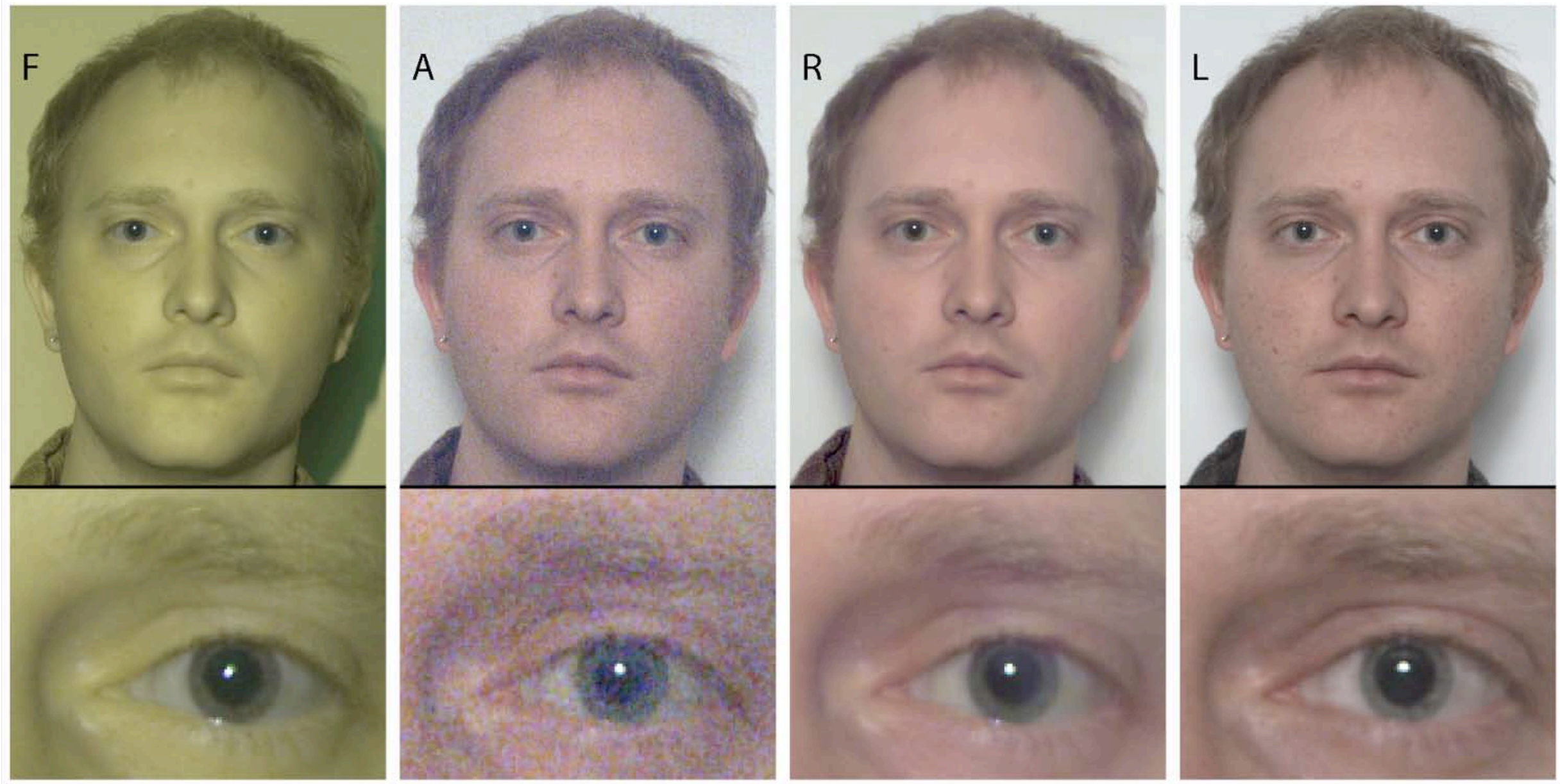

HYATT


aquabus
aquabus

Computational cameras



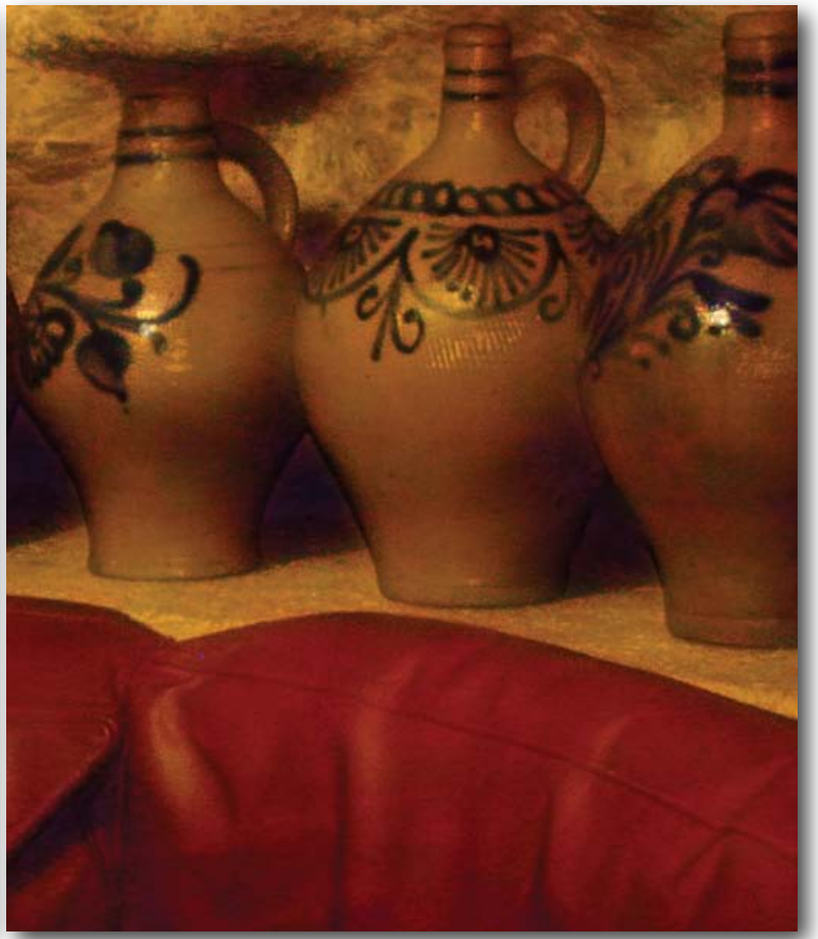
Computational cameras



Flash/no flash pairs

Flash

No-Flash



Detail Transfer with Denoising

Photo tourism