

# School of Engineering and Computer Science

Te Kura Mātai Pūkaha, Pūrorohiko



## Prescription

Image-based graphics brings together the power of image processing and computer graphics to use real-world visual media content to produce vivid, compelling, and meaningful computer graphics. This course studies ways of manipulating and combining images and videos, including image filtering, image manipulation, and video processing.

## Course learning objectives

Students who pass this course should be able to:

1. Describe and demonstrate through implementation in software an understanding of the fundamentals of image representation, colour models, pixel-level manipulation algorithms and filtering-based image processing techniques.
2. Describe and demonstrate through implementation in software an understanding of popular image content manipulation methods like image completion, image composition and content-aware resizing.
3. Describe and demonstrate through implementation in software an understanding of computational photography technology and advanced imaging techniques, like HDR imaging and light field cameras.
4. Describe and demonstrate through implementation in software an understanding of the fundamentals of image matching and warping, and how to perform video enhancement like stabilization. Be able to implement image warping and alignments and a straightforward video stabilizer based on a simple camera model.

## Withdrawal from Course

Withdrawal dates and process:

<https://www.victoria.ac.nz/students/study/course-additions-withdrawals>

## Lecturers

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### Neil Dodgson (Coordinator)

neil.dodgson@vuw.ac.nz 04 4636922

329 Cotton, Kelburn

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### Fanglue Zhang

fanglue.zhang@vuw.ac.nz 04 4637527

331 Cotton, Kelburn

## Teaching Format

Lecture based course assessed through substantial practical programming assignments.

## Student feedback

Student feedback on University courses may be found at:  
[www.cad.vuw.ac.nz/feedback/feedback\\_display.php](http://www.cad.vuw.ac.nz/feedback/feedback_display.php)

## Dates (trimester, teaching & break dates)

- Teaching: 05 March 2018 - 08 June 2018
- Break: 23 April 2018 - 27 April 2018
- Study period: 11 June 2018 - 14 June 2018
- Exam period: 15 June 2018 - 04 July 2018

## Class Times and Room Numbers

### 05 March 2018 - 25 March 2018

- **Thursday** 09:00 - 09:50 – 306, 77 Fairlie Tce, Kelburn
- **Friday** 09:00 - 09:50 – 306, 77 Fairlie Tce, Kelburn

### 05 March 2018 - 01 April 2018

- **Tuesday** 09:00 - 09:50 – 306, 77 Fairlie Tce, Kelburn

### 02 April 2018 - 22 April 2018

- **Thursday** 09:00 - 09:50 – 306, 77 Fairlie Tce, Kelburn
- **Friday** 09:00 - 09:50 – 306, 77 Fairlie Tce, Kelburn

### 09 April 2018 - 22 April 2018

- **Tuesday** 09:00 - 09:50 – 306, 77 Fairlie Tce, Kelburn

### 30 April 2018 - 10 June 2018

- **Tuesday** 09:00 - 09:50 – 306, 77 Fairlie Tce, Kelburn
- **Thursday** 09:00 - 09:50 – 306, 77 Fairlie Tce, Kelburn
- **Friday** 09:00 - 09:50 – 306, 77 Fairlie Tce, Kelburn

## Set Texts and Recommended Readings

### Required

There are no required texts for this offering.

### Recommended

- [Computer vision: algorithms and applications, by Szeliski 2010.](#)

## Mandatory Course Requirements

There are no mandatory course requirements for this course.

*If you believe that exceptional circumstances may prevent you from meeting the mandatory course requirements, contact the Course Coordinator for advice as soon as possible.*

## Assessment

Assessed programming assignment 1	CLO: 1	20%
Assessed programming assignment 2	CLO: 1,2	30%
Assessed programming assignment 3	CLO: 3	20%
Assessed programming assignment 4	CLO: 4	30%

## Penalties

Assignments submitted after the due date will get a 5% penalty per day, up to one week. After this, zero marks will be awarded for the assignment.

## Extensions

Individual extensions will only be granted in exceptional personal circumstances, and should be negotiated with the course coordinator before the deadline whenever possible. Documentation (eg, medical certificate) may be required.

## Submission & Return

All work should be submitted through the ECS submission system, accessible through the course web pages. Marks and comments will be returned through the ECS marking system, also available through the course web pages.

## Workload

Although the workload will vary from week to week, you should expect to spend approximately 10 hours per week on the course to give a total of 150 hours study time for the course.

## Teaching Plan

See: [https://ecs.victoria.ac.nz/Courses/CGRA352\\_2018T1/LectureSchedule](https://ecs.victoria.ac.nz/Courses/CGRA352_2018T1/LectureSchedule)

## Communication of Additional Information

All online material for this course can be accessed at [https://ecs.victoria.ac.nz/Courses/CGRA352\\_2018T1/](https://ecs.victoria.ac.nz/Courses/CGRA352_2018T1/)

## Links to General Course Information

- Academic Integrity and Plagiarism: <https://www.victoria.ac.nz/students/study/exams/integrity-plagiarism>
- Academic Progress: <https://www.victoria.ac.nz/students/study/progress/academic-progress> (including restrictions and non-engagement)
- Dates and deadlines: <https://www.victoria.ac.nz/students/study/dates>

- Grades: <https://www.victoria.ac.nz/students/study/progress/grades>
- Special passes: Refer to the Assessment Handbook, at <https://www.victoria.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf>
- Statutes and policies, e.g. Student Conduct Statute: <https://www.victoria.ac.nz/about/governance/strategy>
- Student support: <https://www.victoria.ac.nz/students/support>
- Students with disabilities: [https://www.victoria.ac.nz/st\\_services/disability/](https://www.victoria.ac.nz/st_services/disability/)
- Student Charter: <https://www.victoria.ac.nz/learning-teaching/learning-partnerships/student-charter>
- Terms and Conditions: <https://www.victoria.ac.nz/study/apply-enroll/terms-conditions/student-contract>
- Turnitin: <http://www.cad.vuw.ac.nz/wiki/index.php/Turnitin>
- University structure: <https://www.victoria.ac.nz/about/governance/structure>
- VUWSA: <http://www.vuwsa.org.nz>

**Offering CRN:** [30096](#)

**Points:** 15

**Prerequisites:** CGRA 251; COMP 261 or NWEN 241; ENGR 122 or MATH 142 or permission of Head of School

**Duration:** 05 March 2018 - 04 July 2018

**Starts:** Trimester 1

**Campus:** Kelburn