



## Prescription

Image-based graphics brings together the power 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 synthesis, seamless 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 feature matching and image warping, and how to perform video enhancement like stabilization. Be able to implement image warping and alignments and a straightforward video stabilizer.

## Course content

The course is primarily offered in-person, but there will also be a remote option and there will be online alternatives for all the components of the course for students who cannot attend in-person.

Students taking this course remotely must have access to a computer with camera and microphone and a reliable high speed internet connection that will support real-time video plus audio connections and screen sharing. Students must be able to use Zoom; other communication applications may also be used. A mobile phone connection only is not considered sufficient. The computer must be adequate to support the programming required by the course: almost any modern windows, macintosh, or unix laptop or desktop computer will be sufficient, but an Android or IOS tablet will not.

If the assessment of the course includes tests, the tests will generally be run in-person on the Kelburn campus. There will be a remote option for students who cannot attend in-person and who have a strong justification (for example, being enrolled from overseas). The remote test option will use the ProctorU system for online supervision of the tests. ProctorU requires installation of monitoring software on your computer which also uses your camera and microphone, and monitors your test-taking in real-time. Students who will need to use the remote test option must contact the course coordinator in the first two weeks to get permission and make arrangements.

## Withdrawal from Course

Withdrawal dates and process:

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

# Lecturers

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## Fanglue Zhang (Coordinator)

fanglue.zhang@vuw.ac.nz 04 4637527

331 Cotton, Kelburn

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## Zohar Levi

zohar.levi@vuw.ac.nz

# Teaching Format

This course will be offered in-person and online. For students in Wellington, there will be a combination of in-person components and web/internet based resources. It will also be possible to take the course entirely online for those who cannot attend on campus, with all the components provided in-person also made available online.

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: 22 February 2021 - 28 May 2021
- Break: 05 April 2021 - 18 April 2021
- Study period: 31 May 2021 - 03 June 2021
- Exam period: 04 June 2021 - 19 June 2021

# Class Times and Room Numbers

## 22 February 2021 - 04 April 2021

- **Monday** 13:10 - 14:00 – 101, 14 Kelburn Pde, Kelburn
- **Tuesday** 12:00 - 12:50 – 104, New Kirk, Kelburn
- **Thursday** 12:00 - 12:50 – 710, Von Zedlitz, Kelburn

## 19 April 2021 - 30 May 2021

- **Monday** 13:10 - 14:00 – 101, 14 Kelburn Pde, Kelburn
- **Tuesday** 12:00 - 12:50 – 104, New Kirk, Kelburn
- **Thursday** 12:00 - 12:50 – 710, Von Zedlitz, 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

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
Assessed programming assignment 1	Week 4	CLO: 1	20%
Assessed programming assignment 2	Week 7	CLO: 1,2	30%
Assessed programming assignment 3	Week 10	CLO: 3	20%
Assessed programming assignment 4	Exam period	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.wgtn.ac.nz/Courses/CGRA352\\_2021T1/LectureSchedule](https://ecs.wgtn.ac.nz/Courses/CGRA352_2021T1/LectureSchedule)

## Communication of Additional Information

All online material for this course can be accessed at [https://ecs.wgtn.ac.nz/Courses/CGRA352\\_2021T1/](https://ecs.wgtn.ac.nz/Courses/CGRA352_2021T1/)

## Links to General Course Information

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

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

**Points:** 15

**Prerequisites:** CGRA 251; COMP 261 or NWEN 241

**Duration:** 22 February 2021 - 20 June 2021

**Starts:** Trimester 1

**Campus:** Kelburn