

ENG6528 – Computer Vision.

Subject details: *First semester 2008*

Credit points: 6

Pre-requisite: foundation in statistics and engineering mathematics

Lectures: 3 hours per week, **Laboratories:** 3 hours per week.

Students must expect to spend a minimum of 3-4 hours of private study per week.

Subject leader: *Dr Robert Mahony,*

Office: room E234, Bldg 32. **Telephone** 02-612.58613, **Email:** Robert.Mahony@anu.edu.au

Office hours: Monday afternoon.

Syllabus: Image formats, binary images, histograms, histogram equalisation, geometric transformations, pixel interpolation, binary morphology, open and close operations, connectedness, linear filtering, 2D convolution, blurring, sharpening, separable kernels, gradient calculation, non-maximal suppression, DoG edge operator, Marr-Hildreth edge detector, Canny edge detector, feature detection, Hough transform, template matching, image correlation, sum of absolute difference, normalised cross-correlation, 2D Fourier transform, 2D-FFT, Nyquist frequency and sampling, power spectrum, low pass, high pass and notch filtering, colour, colour spaces, luminance, chrominance, homogeneous coordinates, coordinate transformations, pin hole camera model, projective geometry, camera calibration, least squares minimization, epipolar geometry, fundamental matrix, normalised 8-point algorithm, essential matrix, patches, texture mapping, pose ambiguity, scale ambiguity, depth maps. Statistical foundations of decision theory.

Assessment:

Assessment:	Marks	Rough timetable.
Laboratory Work	20%	Collected during lab sessions throughout semester.
Problem sheets	10%	Collected during tutorial sessions.
Research Presentation and report	50%	Week 12.
Quiz	10%	Week 7
Quiz	10%	Week 13

Marking exams: Exams can be viewed by contacting the lecturer. The lecturer retains the right to remark the whole exam should the student demand any adjustment in the grade.

Supplementary examination: Supplementary examination will be offered to students that fail the course but achieve an overall grade of above 45%. Supplementary examination will be either a sit down 2-3 hour exam or an oral, at the discretion of the lecturer.

Web Site: A web site for the course will be linked to the department course web site and the ANU webCT. All documents prepared for the course will be posted on the web. All administrative arrangements will be posted on the web site.

Lecture Notes: Lecture notes will be posted on the web site. I will endeavour to have the notes for the coming week posted the preceding week.

References:

There is no recommended text. A list of references is posted on the web site.

Research Topics:

Detecting Human faces, Optic Flow, Structure from Motion, Partial filtering, Hough transform, Template matching and principal component analysis (eigenfaces), Wavelet transformations and Fourier, transformations, Disparity maps, Support vector machines and character recognition, Adaptive tracking.