

COSI Machine Vision

Course level: Master

Course code: 3621518

ECTS Credits: 5.00

Course instructor/s: Pekka Toivanen with assistant

Education period (Dates): 3rd semester

Language of instruction: English

Expected prior-knowledge: Recommended: Data Structures and Algorithms

Aim:

After this course, student knows basics of machine vision including digital image analysis and applications.

Teaching methods:

Lectures and exercises.

Course outline:

Digital image, image filtering, restoration and compression, image transforms. Color and spectral machine vision. Image analysis: image segmentation, representation, recognition and interpretation. Applications.

Lab experiments:

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Examination:

Written exam 2 hours, ordinary re-sit examination.

Learning Outcomes¹:

- *Knowledge and Comprehension* of the fundamentals, principles, applications, limits, relationships, of all concepts and topics covered by this course;
- *Application, Analysis, Synthesis and Evaluation* skills of the main concepts and topics covered by this course;
- Ability to apply/implement concepts and principles introduced in the lectures and laboratory exercises on practical tasks and on industrial study cases;
- Ability to self-learn, to understand some problems and to suggest/find solutions to solve these problems.

Assessment methods and tasks:

Written Examination, Practical Exercises, Participation in Teaching.

Assessment criterion:

Written exam and Practical works

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|---|----|
| Excellent - outstanding performance | A |
| Very Good - above the average standard but with some errors | B |
| Good - generally sound work with a number of notable errors | C |
| Satisfactory - fair but with significant shortcomings | D |
| Sufficient - performance meets the minimum criteria | E |
| Fail - some more work required before the credit can be awarded | FX |
| Fail - considerable further work is required | F |

¹ The meaning of *keywords* written in italic used to define Learning Outcomes are detailed in Annex.

Detail of criteria used to assess acquired skills :

- *Activities and questionnaires giving evidence of knowing (5%)*
- *Activities and questionnaires giving evidence of comprehension/understanding (5%)*
- *Activities and questionnaires giving evidence of analysis (5%)*
- *Activities and questionnaires giving evidence of synthesis (5%)*
- *Activities and questionnaires giving evidence of evaluation (5%)*

| | |
|---|----|
| Excellent | A |
| Very Good - above the average standard | B |
| Good - generally sound well | C |
| Satisfactory - but with significant shortcomings | D |
| Sufficient - performance meets the minimum criteria | E |
| Fail - some more work required | FX |
| Fail - considerable further work is required | F |

The evaluation of informal learning outcomes will be based on questionnaires and laboratory notebook (self evaluation, learning diary).

Literature and study materials:

- Rafael C. Gonzalez, Richard E. Woods: Digital Image Processing, 2nd Edition, Prentice-Hall, 2002.

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