Module Descriptor 2012/13
School of Computer Science and Statistics.

<table>
<thead>
<tr>
<th>Module Code</th>
<th>CS7005</th>
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<tbody>
<tr>
<td>Module Name</td>
<td>Context Awareness</td>
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<tr>
<td>Module Short Title</td>
<td>N/a</td>
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<tr>
<td>ECTS weighting</td>
<td>5</td>
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<tr>
<td>Semester/term taught</td>
<td>Hilary</td>
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| Contact Hours | Lecture hours:22  
Lab hours:  
Tutorial hours:11  
Total hours:33 |
| Module Personnel | Lecturing staff: Dr. Martin Emms |

**Learning Outcomes**

- students should be able to:
  - see the critical assumptions of different approaches and make informed decisions concerning applicability
  - Analyse research publications in context awareness and synthesize contents into a presentation including critique of strengths and weaknesses
  - trace the steps of the critical algorithms
  - use available software to verify small scale algorithm outcomes and confirm larger scale research findings

**Module Learning Aims**

A wide variety of algorithms are used in systems which attempt to automatically respond intelligently to aspects of the context. One of the aims of the course is to impart an understanding of the basic assumptions of some of the most widely used techniques (including Naive Bayes, Hidden Markov models and Bayesian Networks), and the most important algorithms used in implementing them. This is facilitated by pencil-and-paper calculation and also used of available software to verify small scale algorithm outcomes and confirm larger scale research findings

Another aim is to gain an overview of the variety of context-aware systems, both the variety of the inputs and responses and variety of algorithms. This is facilitated by assigning research publications centred around a particular to groups who have to present the content of these publications to their fellow students.

**Module Content**

- Bayesian classifiers
- Naive Bayes
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<table>
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<tr>
<th>Topic</th>
<th>Details</th>
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<tbody>
<tr>
<td>Smoothing of empirical estimates</td>
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<td>Bayesian Networks</td>
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<td>Hidden Markov models</td>
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<td>Applications of above to problems such as activity classification and location detection using information from discrete sensors, audio, pressure sensors, and accelerometers</td>
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#### Recommended Reading List

#### Module Pre Requisite
None. *Familiarity with probability theory would be advantageous*.

#### Module Co Requisite
None.

#### Assessment Details
- % Exam: 70
- % Coursework: 30

Each assessment component must be independently passed (ie 40% or more on each) and aggregated according to above weighting result must be at least 40%.

#### Module approval date
N/a

#### Approved By
N/a

#### Academic Start Year
N/a

#### Academic Year of Data
N/a