Machine Intelligence & Synthesis (3) Recommend to be taken after EEL-5840 but not required. Theory of machine intelligence applied to the general problem of engineering intelligent computer systems and architecture. Applications emphasized.


Allen, *Natural Language Understanding*, Benjamin Cummins, 1995

A. Antonio Arroyo, Associate Professor of ECE

To study the engineering applications of Machine Intelligence, its impact on EE research and some of its most important tools and paradigms.

1. Recursive programming
2. Introductory AI principles
3. Logic and the predicate calculus

1. First Order Predicate Logic review
2. Deduction, Logic Programming & Prolog
3. Communicating, Perceiving and Acting
4. Natural Language Processing

5. Classical Machine Learning Principles
6. Uncertainty & Reasoning
7. Artificial Life
8. Rule-Based Paradigm & Shells
9. Schema-based Representations

The students using Prolog and other systems will program two or three medium-sized projects. Instructor will choose the topics to be covered after Spring Break and will supplement textbook material with papers and/or other material to keep the course topics current. Students will also read and make an oral and/or written presentation on a current journal paper.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Take-home Midterm</td>
<td>50%</td>
</tr>
<tr>
<td>Paper Presentation &amp; Written Summary</td>
<td>30%</td>
</tr>
</tbody>
</table>

Weekly programming assignments using a free PC-based Prolog (e.g., SWI-Prolog). One major problem from the examples discussed in class may be assigned as a project. Homework and programs count 1/5 of the grade.