## List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>ITS as a Control System</td>
<td>4</td>
</tr>
<tr>
<td>2.1</td>
<td>A fuzzy inference system.</td>
<td>16</td>
</tr>
<tr>
<td>2.2</td>
<td>Commonly used fuzzy if-then rules and fuzzy reasoning mechanisms.</td>
<td>18</td>
</tr>
<tr>
<td>2.3</td>
<td>Takagi-Sugeno's Inference Mechanism.</td>
<td>19</td>
</tr>
<tr>
<td>2.4</td>
<td>A Hybrid Neural Network showing Sugeno's Fuzzy Inference</td>
<td>20</td>
</tr>
<tr>
<td>2.5</td>
<td>Evolution of Intelligent Tutoring Systems.</td>
<td>24</td>
</tr>
<tr>
<td>2.6</td>
<td>Architecture of a web-based ITS.</td>
<td>26</td>
</tr>
<tr>
<td>3.1</td>
<td>(a) Fuzzy Reasoning; (b) Equivalent ANFIS.</td>
<td>48</td>
</tr>
<tr>
<td>4.1</td>
<td>A Traditional Teaching-Learning Process</td>
<td>60</td>
</tr>
<tr>
<td>4.2</td>
<td>A Fuzzy Finite State Automata.</td>
<td>74</td>
</tr>
<tr>
<td>4.3</td>
<td>A Fuzzy Finite State Machine (Lesson Level)</td>
<td>78</td>
</tr>
<tr>
<td>4.4</td>
<td>Tutor Finite State Machine</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>(Unit level &amp; Topic level)</td>
<td></td>
</tr>
<tr>
<td>4.5</td>
<td>ANFIS as a Fuzzy Finite State Machine</td>
<td>82</td>
</tr>
<tr>
<td>5.1</td>
<td>Three-Layer Domain Model</td>
<td>106</td>
</tr>
<tr>
<td>7.1</td>
<td>ITS as a Control System</td>
<td>145</td>
</tr>
<tr>
<td>7.2</td>
<td>A typical Feedback Control</td>
<td>146</td>
</tr>
<tr>
<td>7.3</td>
<td>Architecture of FUN-WITS</td>
<td>148</td>
</tr>
<tr>
<td>7.4</td>
<td>Plot showing the comparison of 'performance' levels (Group 1)</td>
<td>154</td>
</tr>
<tr>
<td>7.5</td>
<td>Plot showing the comparison of 'state' transitions (Group 1)</td>
<td>155</td>
</tr>
<tr>
<td>7.6</td>
<td>Plot showing the comparison of the 'lesson classes' (Group 1)</td>
<td>155</td>
</tr>
<tr>
<td>7.7</td>
<td>Plot showing the comparison of 'performance' levels (Group 2)</td>
<td>156</td>
</tr>
<tr>
<td>7.8</td>
<td>Plot showing the comparison of 'state' transitions (Group 2)</td>
<td>156</td>
</tr>
<tr>
<td>7.9</td>
<td>Plot showing the comparison of the 'lesson classes' (Group 2)</td>
<td>157</td>
</tr>
</tbody>
</table>