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| logo.jpg  **Artificial Neural Networks Course**  **Computer Science Department**  **Faculty of Computer and Information Sciences**  **Ain Shams University, Egypt** |
| **A Report of Final Project – (MLP)**  **By** |

|  |  |
| --- | --- |
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| **Project Title** | |
| **"*Object Detection and Recognition*"** | |

**2nd Semester 2017\2018**

# **MLP Models (Results)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **# Epochs** | **Input layer** | | **Hidden layers** | | **Output layer** | |
| 1000 | # Neurons | 25 | # Hidden layers | 1 | # Neurons | 5 |
|  |  | | Hidden layer (1) | |  | |
|  |  | | # Neurons | 5 |  |  |
| **Learning** **rate** | 0.01 | | **Stopping Criteria** | 0.1 | **Accuracy** | 34% |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **# Epochs** | **Input layer** | | **Hidden layers** | | **Output layer** | |
| 1000 | # Neurons | 25 | # Hidden layers | 2 | # Neurons | 5 |
|  |  | | Hidden layer (1) | |  | |
|  |  | | # Neurons | 5 |  |  |
|  |  | | Hidden layer (2) | |  |  |
|  |  | | # Neurons | 5 |  |  |
| **Learning** **rate** | 0.01 | | **Stopping Criteria** | 0.1 | **Accuracy** | 30% |

**Model 3**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **# Epochs** | **Input layer** | | **Hidden layers** | | **Output layer** | |
| 2000 | # Neurons | 25 | # Hidden layers | 2 | # Neurons | 5 |
|  |  | | Hidden layer (1) | |  | |
|  |  | | # Neurons | 15 |  |  |
|  |  | | Hidden layer (2) | |  |  |
|  |  | | # Neurons | 15 |  |  |
| **Learning** **rate** | 0.5 | | **Stopping Criteria** | 0.01 | **Accuracy** | 26% |

**Model 4**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **# Epochs** | **Input layer** | | **Hidden layers** | | **Output layer** | |
| 2000 | # Neurons | 25 | # Hidden layers | 3 | # Neurons | 5 |
|  |  | | Hidden layer (1) | |  | |
|  |  | | # Neurons | 8 |  |  |
|  |  | | Hidden layer (2) | |  |  |
|  |  | | # Neurons | 7 |  |  |
|  |  | | Hidden layer (3) | |  |  |
|  |  | | # Neurons | 6 |  |  |
| **Learning** **rate** | 0.5 | | **Stopping Criteria** | 0.01 | **Accuracy** | 26% |

**Model 5**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **# Epochs** | **Input layer** | | **Hidden layers** | | **Output layer** | |
| 1000 | # Neurons | 23 | # Hidden layers | 1 | # Neurons | 5 |
|  |  | | Hidden layer (1) | |  | |
|  |  | | # Neurons | 5 |  |  |
| **Learning** **rate** | 0.01 | | **Stopping Criteria** | 0.1 | **Accuracy** | 73% |

**Model 6**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **# Epochs** | **Input layer** | | **Hidden layers** | | **Output layer** | |
| 1000 | # Neurons | 23 | # Hidden layers | 1 | # Neurons | 5 |
|  |  | | Hidden layer (1) | |  | |
|  |  | | # Neurons | 10 |  |  |
| **Learning** **rate** | 0.01 | | **Stopping Criteria** | 0.01 | **Accuracy** | 80% |

# **The Best MLP Model**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **# Epochs** | **Input layer** | | **Hidden layers** | | **Output layer** | |
| 1000 | # Neurons | 23 | # Hidden layers | 1 | # Neurons | 5 |
|  |  | | Hidden layer (1) | |  | |
|  |  | | # Neurons | 15 |  |  |
| **Learning** **rate** | 0.1 | | **Stopping Criteria** | 0.001 | **Accuracy** | 84% |