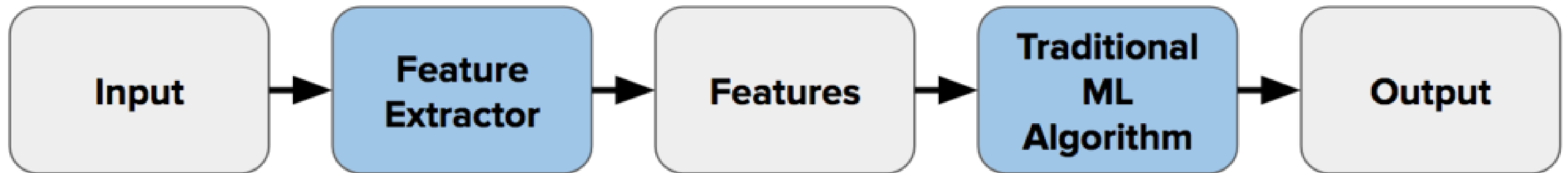
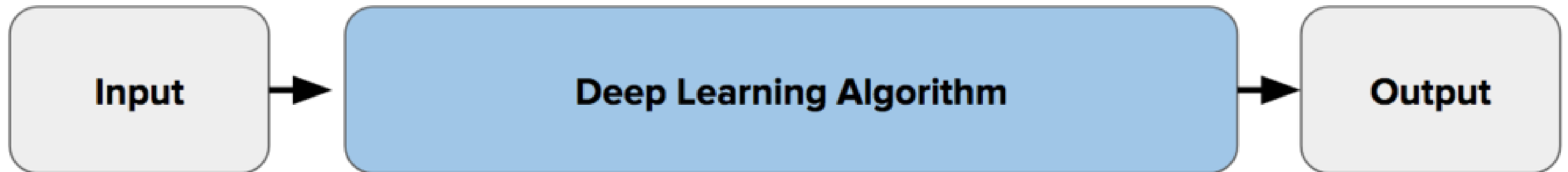


AI General Workflow



Traditional Machine Learning Flow



Deep Learning Flow

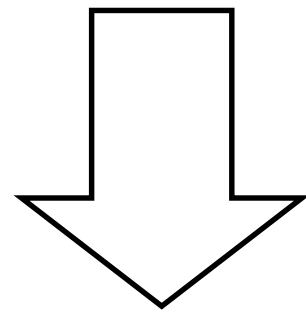
How AI Learn Data?



How AI Learn Data?

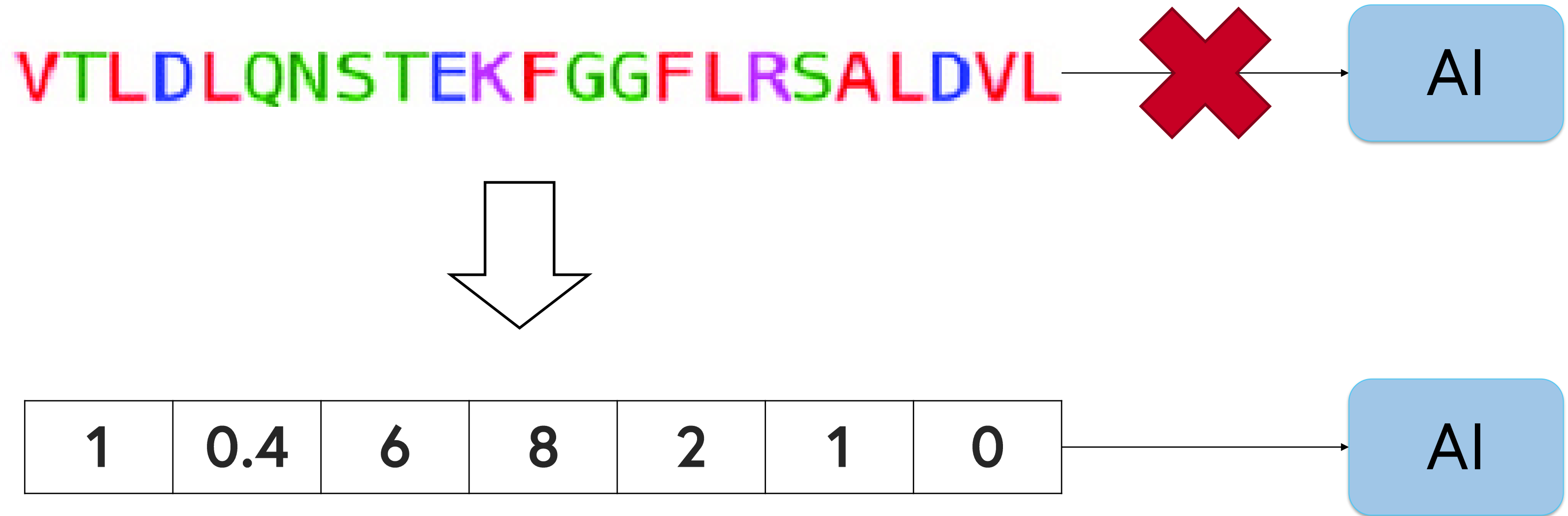


How AI Learn Data?



| | | | | | | |
|---|-----|---|---|---|---|---|
| 1 | 0.4 | 6 | 8 | 2 | 1 | 0 |
|---|-----|---|---|---|---|---|

How AI Learn Data?



Gene Expression Data

| GENE | GSM767976 | GSM767977 | GSM767978 | GSM767979 | GSM767980 | GSM767981 | GSM767982 | GSM767983 |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| MIR4640 | 11.24 | 11.47 | 10.95 | 11.54 | 11.3 | 11.3 | 11.79 | 11.95 |
| RFC2 | 8.55 | 8.56 | 8.93 | 9.52 | 8.59 | 8.89 | 8.7 | 9.46 |
| HSPA6 | 4.9 | 5.89 | 6.12 | 6.89 | 3.39 | 5.92 | 5.77 | 6.27 |
| PAX8 | 2.83 | 2.83 | 2.43 | 2.75 | 2.79 | 2.84 | 2.18 | 2.84 |
| GUCA1A | 2.08 | 2.08 | 2.07 | 2.07 | 2.09 | 2.09 | 2.07 | 2.08 |
| MIR5193 | 7.45 | 9.8 | 6.9 | 6.91 | 6.69 | 7.85 | 8.2 | 9.1 |
| THRA | 7.73 | 4.62 | 8.11 | 7.71 | 7.91 | 4.63 | 8.51 | 5.74 |
| PTPN21 | 3.07 | 2.31 | 4.06 | 2.67 | 2.67 | 2.61 | 2.42 | 2.56 |
| CCL5 | 2.91 | 6.6 | 2.62 | 2.51 | 2.68 | 2.74 | 2.45 | 2.77 |
| CYP2E1 | 4.74 | 6.58 | 4.8 | 5.9 | 2.61 | 4.65 | 4.63 | 8.95 |
| EPHB3 | 2.15 | 2.16 | 2.96 | 3.22 | 2.16 | 2.16 | 2.22 | 3.41 |
| ESRRA | 9.65 | 10.59 | 9.31 | 10.16 | 9.99 | 10.94 | 9.76 | 10.49 |
| CYP2A6 | 2 | 2.01 | 2 | 2 | 2.01 | 2.01 | 2 | 2.01 |
| SCARB1 | 6.36 | 6.44 | 5.47 | 5.62 | 5.74 | 5.69 | 4.87 | 5.56 |
| TTLL12 | 10.11 | 10.89 | 11.3 | 11.63 | 10.89 | 11.52 | 10.71 | 11.33 |

Gene Expression Data

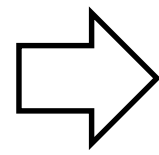
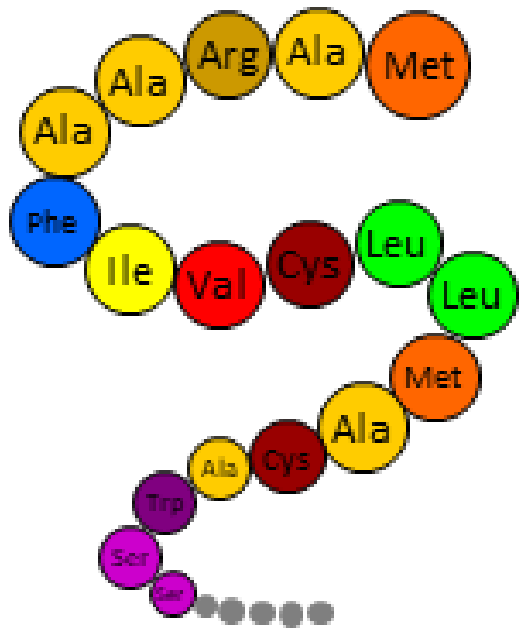
| GENE | GSM767976 | GSM767977 | GSM767978 | GSM767979 | GSM767980 | GSM767981 | GSM767982 | GSM767983 |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| MIR4640 | 11.24 | 11.47 | 10.95 | 11.54 | 11.3 | 11.3 | 11.79 | 11.95 |
| RFC2 | 8.55 | 8.56 | 8.93 | 9.52 | 8.59 | 8.89 | 8.7 | 9.46 |
| HSPA6 | 4.9 | 5.89 | 6.12 | 6.89 | 3.39 | 5.92 | 5.77 | 6.27 |
| PAX8 | 2.83 | 2.83 | 2.43 | 2.75 | 2.79 | 2.84 | 2.18 | 2.84 |
| GUCA1A | 2.08 | 2.08 | 2.07 | 2.07 | 2.09 | 2.09 | 2.07 | 2.08 |
| MIR5193 | 7.45 | 9.8 | 6.9 | 6.91 | 6.69 | 7.85 | 8.2 | 9.1 |
| THRA | 7.73 | 4.62 | 8.11 | 7.71 | 7.91 | 4.63 | 8.51 | 5.74 |
| PTPN21 | 3.07 | 2.31 | 4.06 | 2.67 | 2.67 | 2.61 | 2.42 | 2.56 |
| CCL5 | 2.91 | 6.6 | 2.62 | 2.51 | 2.68 | 2.74 | 2.45 | 2.77 |
| CYP2E1 | 4.74 | 6.58 | 4.8 | 5.9 | 2.61 | 4.65 | 4.63 | 8.95 |
| EPHB3 | 2.15 | 2.16 | 2.96 | 3.22 | 2.16 | 2.16 | 2.22 | 3.41 |
| ESRRA | 9.65 | 10.59 | 9.31 | 10.16 | 9.99 | 10.94 | 9.76 | 10.49 |
| CYP2A6 | 2 | 2.01 | 2 | 2 | 2.01 | 2.01 | 2 | 2.01 |
| SCARB1 | 6.36 | 6.44 | 5.47 | 5.62 | 5.74 | 5.69 | 4.87 | 5.56 |
| TTLL12 | 10.11 | 10.89 | 11.3 | 11.63 | 10.89 | 11.52 | 10.71 | 11.33 |

Gene Expression Data

| GENE | GSM767976 | GSM767977 | GSM767978 | GSM767979 | GSM767980 | GSM767981 | GSM767982 | GSM767983 |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| MIR4640 | 11.24 | 11.47 | 10.95 | 11.54 | 11.3 | 11.3 | 11.79 | 11.95 |
| RFC2 | 8.55 | 8.56 | 8.93 | 9.52 | 8.59 | 8.89 | 8.7 | 9.46 |
| HSPA6 | 4.9 | 5.89 | 6.12 | 6.89 | 3.39 | 5.92 | 5.77 | 6.27 |
| PAX8 | 2.83 | 2.83 | 2.43 | 2.75 | 2.79 | 2.84 | 2.18 | 2.84 |
| GUCA1A | 2.08 | 2.08 | 2.07 | 2.07 | 2.09 | 2.09 | 2.07 | 2.08 |
| MIR5193 | 7.45 | 9.8 | 6.9 | 6.91 | 6.69 | 7.85 | 8.2 | 9.1 |
| THRA | 7.73 | 4.62 | 8.11 | 7.71 | 7.91 | 4.63 | 8.51 | 5.74 |
| PTPN21 | 3.07 | 2.31 | 4.06 | 2.67 | 2.67 | 2.61 | 2.42 | 2.56 |
| CCL5 | 2.91 | 6.6 | 2.62 | 2.51 | 2.68 | 2.74 | 2.45 | 2.77 |
| CYP2E1 | 4.74 | 6.58 | 4.8 | 5.9 | 2.61 | 4.65 | 4.63 | 8.95 |
| EPHB3 | 2.15 | 2.16 | 2.96 | 3.22 | 2.16 | 2.16 | 2.22 | 3.41 |
| ESRRA | 9.65 | 10.59 | 9.31 | 10.16 | 9.99 | 10.94 | 9.76 | 10.49 |
| CYP2A6 | 2 | 2.01 | 2 | 2 | 2.01 | 2.01 | 2 | 2.01 |
| SCARB1 | 6.36 | 6.44 | 5.47 | 5.62 | 5.74 | 5.69 | 4.87 | 5.56 |
| TTLL12 | 10.11 | 10.89 | 11.3 | 11.63 | 10.89 | 11.52 | 10.71 | 11.33 |

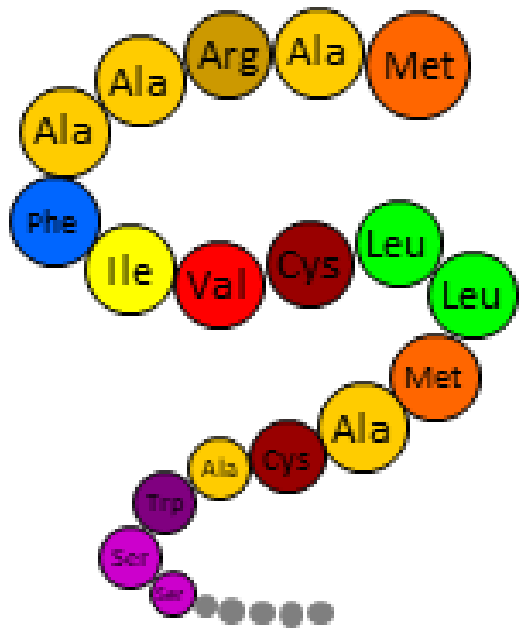
Step By Step

Step By Step



Feature
extraction

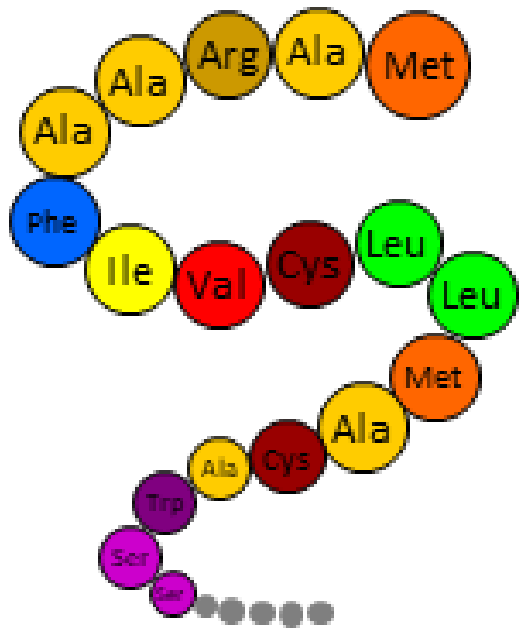
Step By Step



Feature
extraction

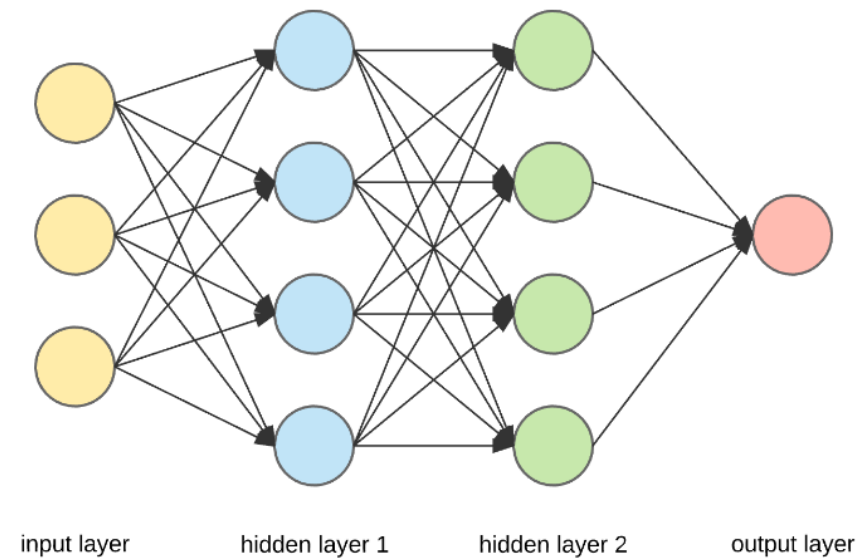
- Amino Acid Composition (AAC)
- Dipeptide Pair Composition (DPC)
- Position Scoring Specific Matrix (PSSM)

Step By Step

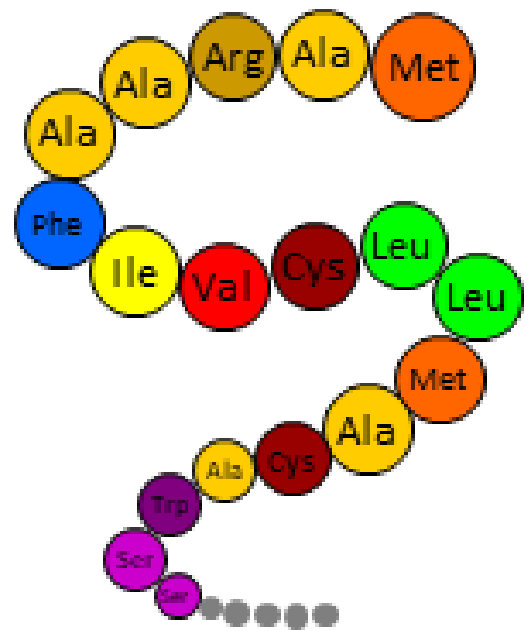


Feature
extraction

- Amino Acid Composition (AAC)
- Dipeptide Pair Composition (DPC)
- Position Scoring Specific Matrix (PSSM)

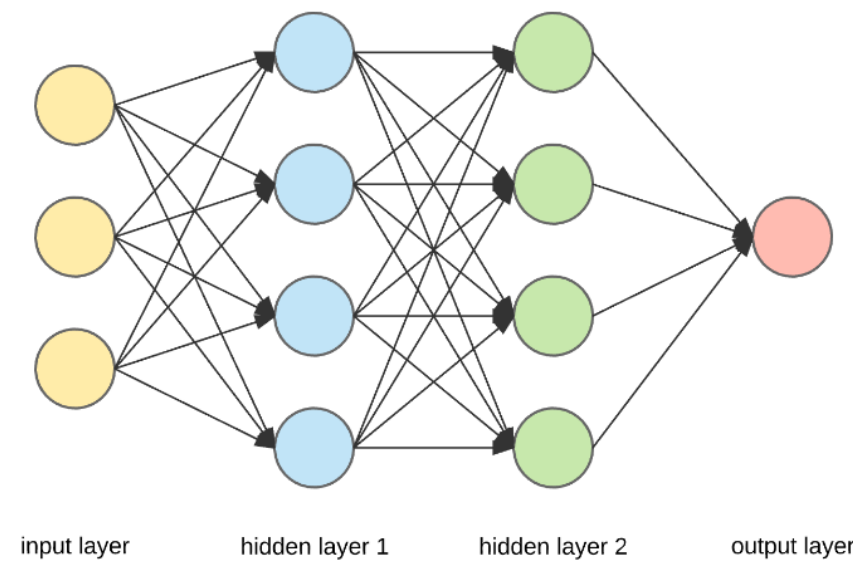
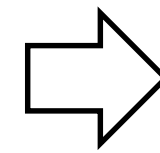


Step By Step



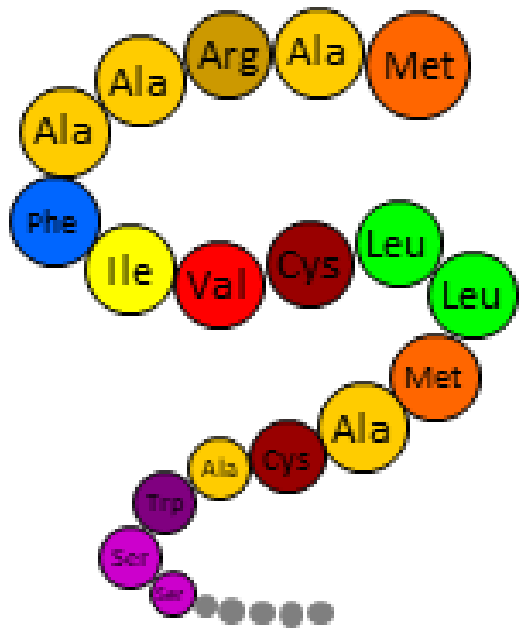
Feature
extraction

- Amino Acid Composition (AAC)
- Dipeptide Pair Composition (DPC)
- Position Scoring Specific Matrix (PSSM)



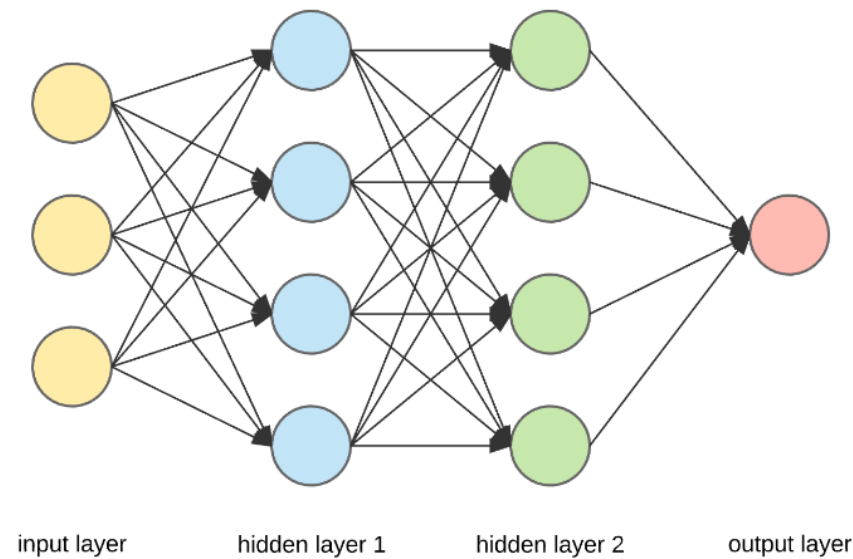
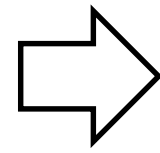
- Radial Basis Function Networks
- Support Vector Machine
- Deep Neural Networks

Step By Step



Feature
extraction

- Amino Acid Composition (AAC)
- Dipeptide Pair Composition (DPC)
- Position Scoring Specific Matrix (PSSM)



Outcomes

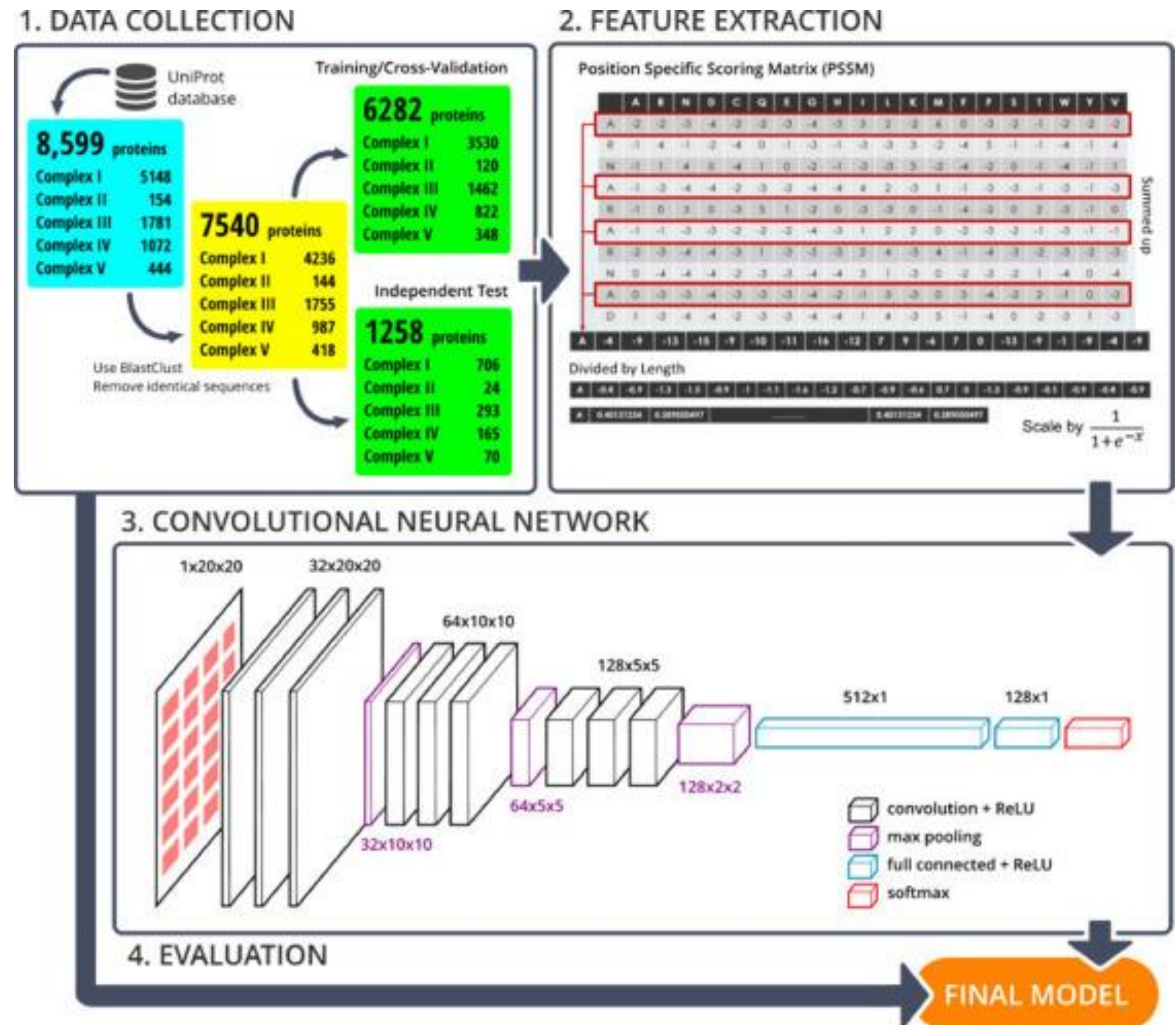
- Radial Basis Function Networks
- Support Vector Machine
- Deep Neural Networks

Examples

“

DeepETC: A deep convolutional neural network architecture for investigating and classifying electron transport chain's complexes

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Examples

“

Using deep neural networks and biological subwords to detect protein S-sulfenylation sites

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