# Results

No defaults (# of epochs, batch size, etc.) were changed from original code.

All optimizers from https://pytorch.org/docs/stable/optim.html#algorithms.

| Optimizer | Accuracy | Loss | Recall | F1 | AUC |
|---|---|---|---|---|---|
| Adam | .718 | .639 | .706 | .612 | .772 |
| Adamax | .698 | .643 | .706 | .603 | .770 |
| RMSprop | .769 | .632 | .687 | .636 | .766 |
| SGD w/ Momentum | .638 | .691 | .606 | .532 | .649 |
| Adadelta | .145 | .693 | .500 | .127 | .482 |
| Adagrad | .690 | .664 | .678 | .587 | .743 |
| **NAdam** | .770 | .643 | .689 | .637 | .770 |
| **RAdam** | .650 | .656 | .698 | .571 | .766 |
| **Rprop** | .692 | .600 | .706 | .599 | .771 |
| **ASGD** | .540 | .693 | .559 | .467 | .582 |

Adam = Default optimizer used in paper

NAdam = Biggest improvement

Adam vs NAdam Results

| Optimizer | Accuracy | Loss | Recall | F1 | AUC |
|---|---|---|---|---|---|
| Adam | .718 | .639 | .706 | .612 | .772 |
| NAdam | .770 | .643 | .689 | .637 | .770 |
| Difference | +6.99% | +.62% | -2.44% | +4% | -.26% |

**Summary:**

With NAdam improving the accuracy by almost 7% and F1 score increasing by 4%, it was enough to show a considerable improvement, despite the minor increase in loss (.62%) and minor decreases in recall (2.4%) and AUC (.26%).