Enforcing Generality with Intrinsic Dimensionality

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What is intrinsic dimensionality?

Random Matrix

$$\theta^{(D)} = \theta_0^{(D)} + P\theta^{(d)}$$
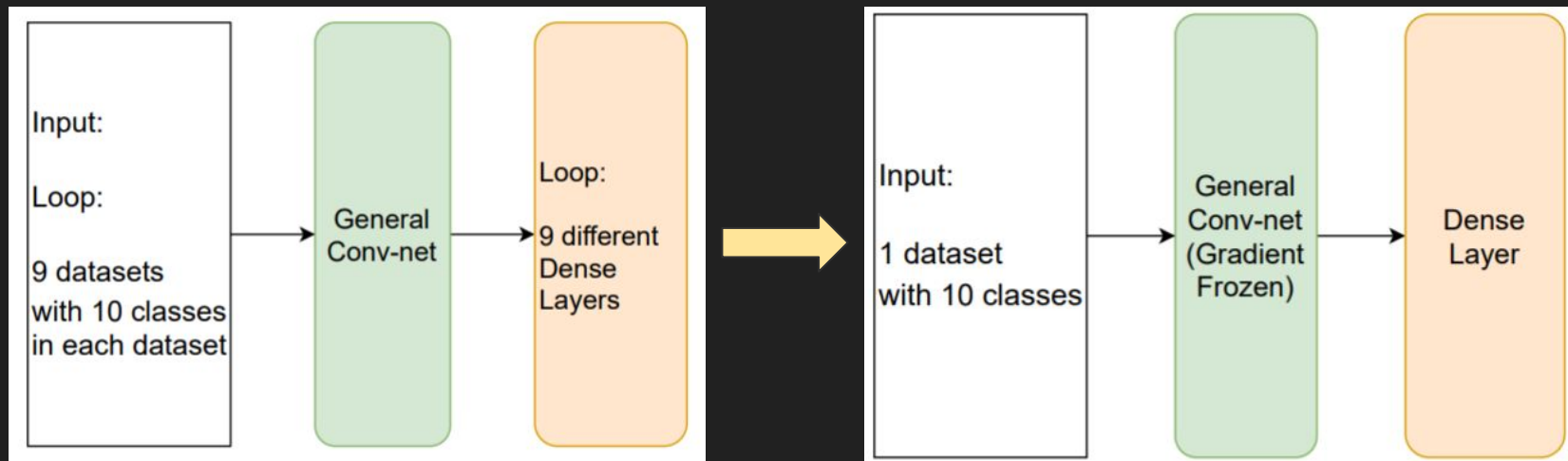
Final Weights of dim=D

Reshaped into net

Random vector of dim=D

Learned vector of dim=d

Partial Multi-Task Learning

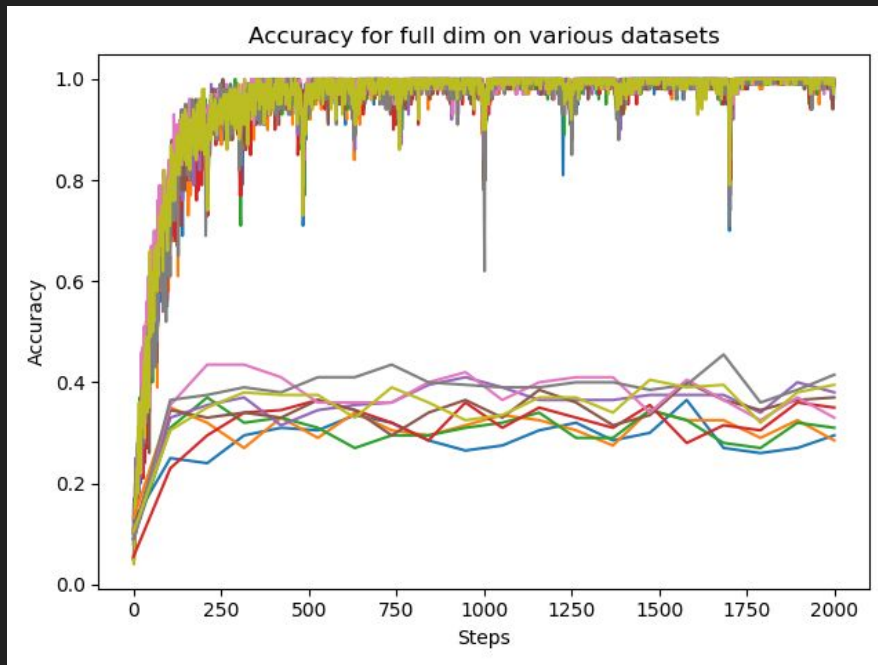Can generality be enforced for MTL by training on a lower dimensionality?

Results

Dimensionality	Final Accuracy
400	78%
600	84%
800	69%
1000	81%
1200	76%

Issues

- Augmentation
- Memory Issues
- Overtraining
- Possibly overly expressive net

Accuracy for full dim on various datasets

Further Work

- Train on more dims
- Use larger dataset to help with overfitting
- Experiment with smaller conv-nets
- Experiment with conv-nets used in real world applications (this will require more memory and computational power)
- Apply general principle to other nets (not just image classification)