Lossy compression for lossless prediction

EECS Seminar: Advanced Topics in Machine Learning

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Motivation

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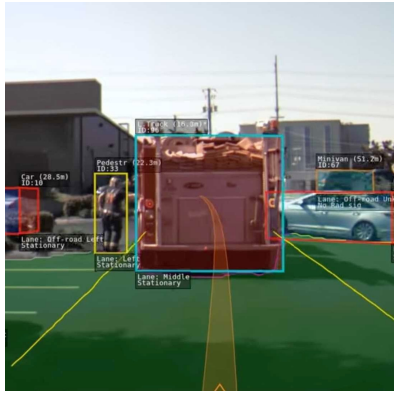

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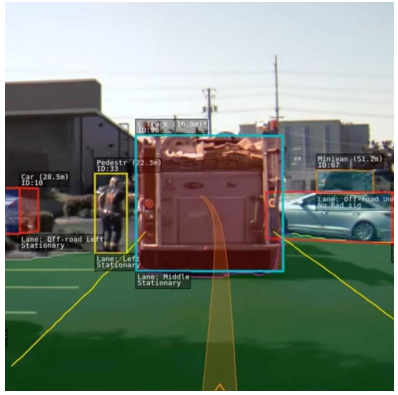

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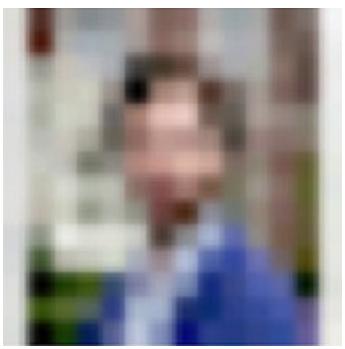

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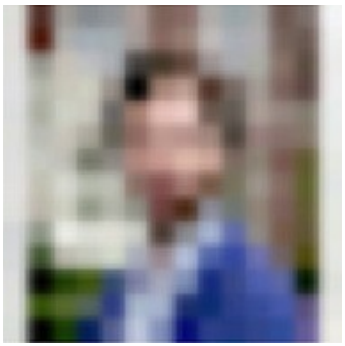

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Desired

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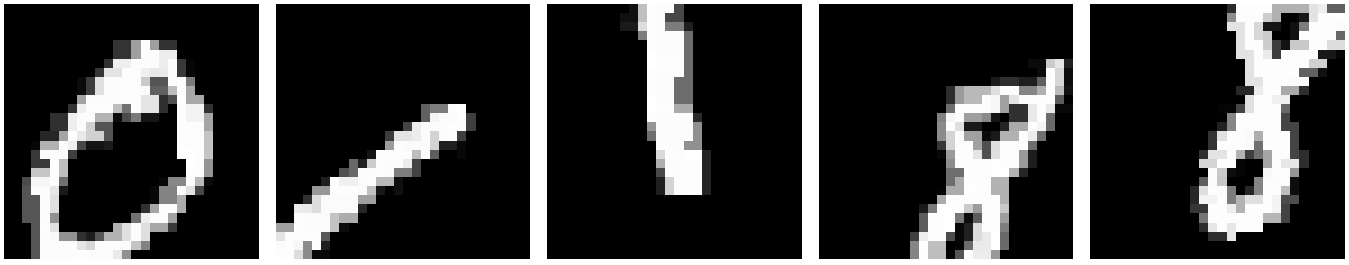
- Characterize minimum bit-rate to ensure high performance on desired tasks;
- Derive unsupervised objectives for training **task-centric** compressors;
- $> 1000x$ compression gains on Imagenet compared to JPEG (see Slide 5).

Intuition: Augmented MNIST



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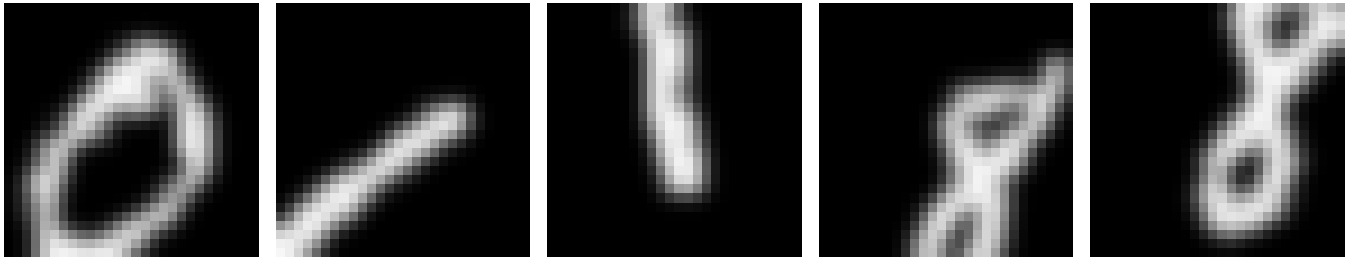
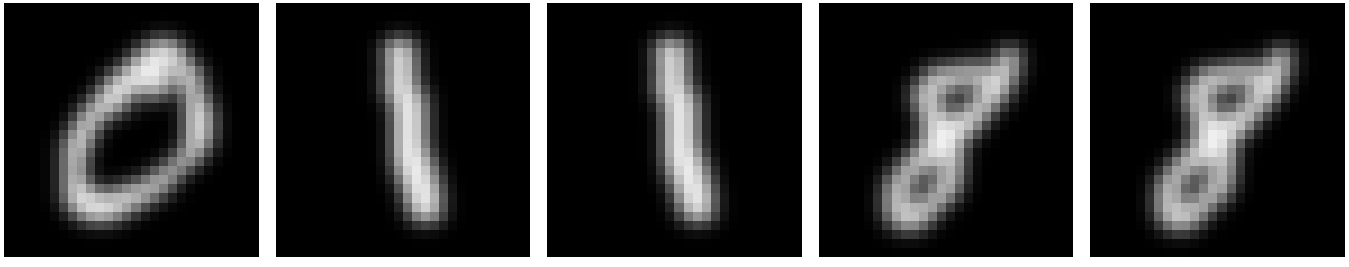


Standard neural compressor: 130 bit-rate



Their neural compressor: 48 bit-rate

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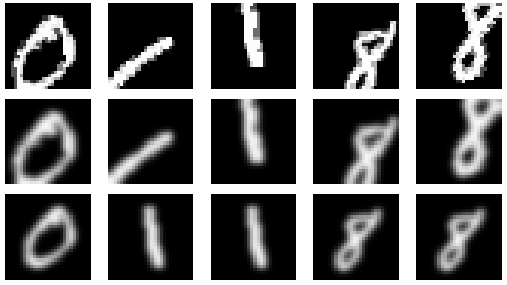

Prototypical digit ensures → high downstream performance
→ good compression rate

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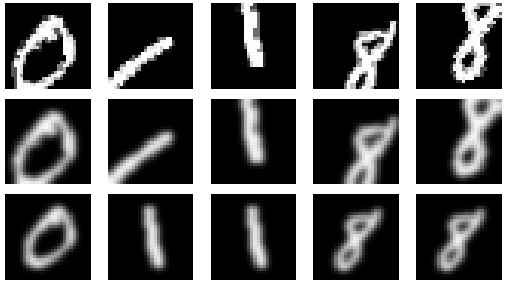

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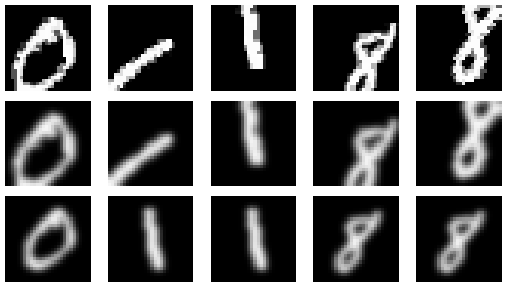

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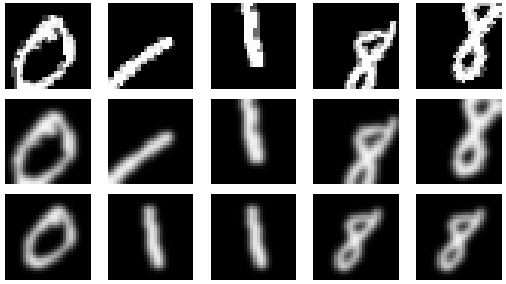

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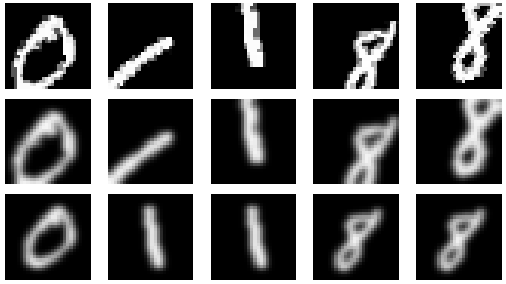

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→ The objective is **unsupervised**

Performance