GAN-based Photo Video Synthesis

Summary of Generative Adversarial Nets

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What is Generative Adversarial Networks (GAN)?

- Generative - creating new data that depends on the choice of the training set
- Adversarial - competitive between the two models: the Generator and the Discriminator
- Networks - neural networks
Two Networks

- GANs consist of two networks: the Generator (G) and the Discriminator (D)
- Generator - To produce examples that capture the characteristics of the training dataset
- Discriminator - To determine whether a particular example is real or fake
Two Networks

- The generative model can be thought of as analogous to a team of counterfeiters, trying to produce fake currency and use it without detection, while the discriminative model is analogous to the police, trying to detect the counterfeit currency.
- The generator learns through the feedback it receives from the discriminator’s classifications.
- Create realistic-looking data from scratch.
- Both networks continue to improve simultaneously.
## Generator and Discriminator subnetworks

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<thead>
<tr>
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<th><strong>Generator</strong></th>
<th><strong>Discriminator</strong></th>
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<tbody>
<tr>
<td>Input</td>
<td>A vector of random numbers</td>
<td>The Discriminator receives input from two sources:</td>
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<tr>
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<td>- Real examples coming from the training dataset</td>
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<td>- Fake examples coming from the Generator</td>
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<tr>
<td>Output</td>
<td>Fake examples that strive to be as convincing as possible</td>
<td>Predicted probability that the input example is real</td>
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<td>Goal</td>
<td>Generate fake data that is indistinguishable from members of the training dataset</td>
<td>Distinguish between the fake examples coming from the Generator and the real examples coming from the training dataset</td>
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Questions

- Will differentiable programming help GAN?
REFERENCE
