

Generating Parkinson's Disease gait patterns using Generative Adversarial Network

Neurodegenerative Diseases

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Data Collection

- **Wearable physiograph**

- Three plantar pressure sensors for each leg:
 - Below the toe
 - Metatarsal arch
 - Heel area
- Two EMG channels for each leg that acquire:
 - Tibialis anterior muscle activity
 - Gastrocnemius medialis muscle activity
- Accelerometer mounted on subject's wrist

- **16 subjects in the study group**

- 12 patients
- 3 healthy controls
- 1 suspect

Image Generation

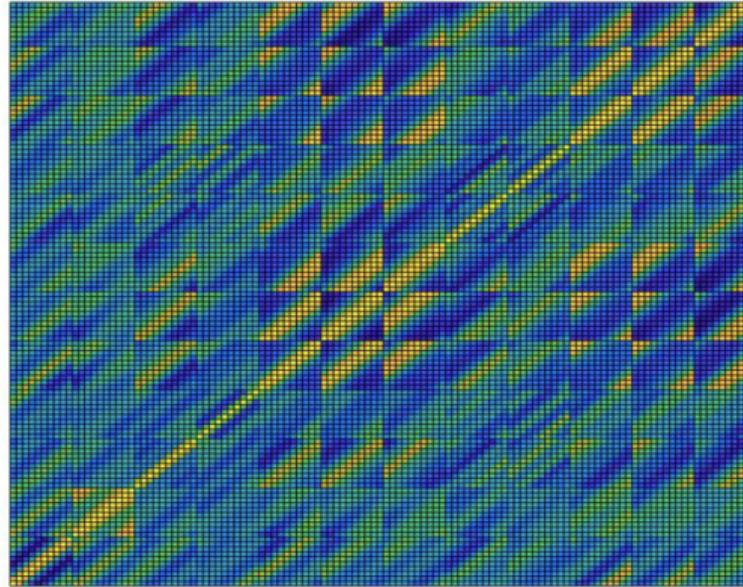
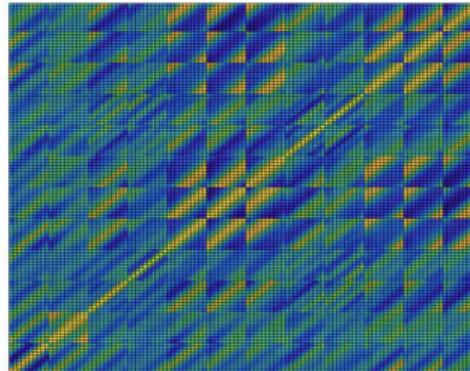


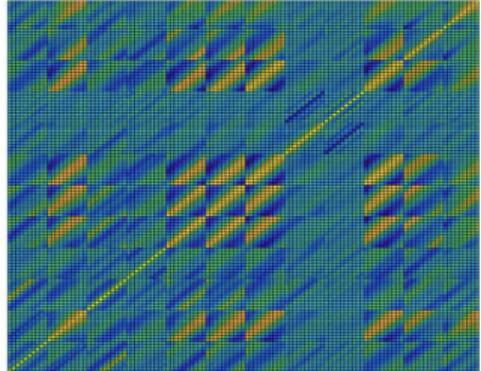
Figure: Image Generation Scheme and Example

Old Dataset

 1253 generated images



(a)

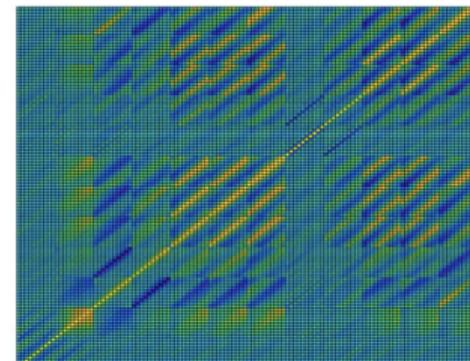


(b)

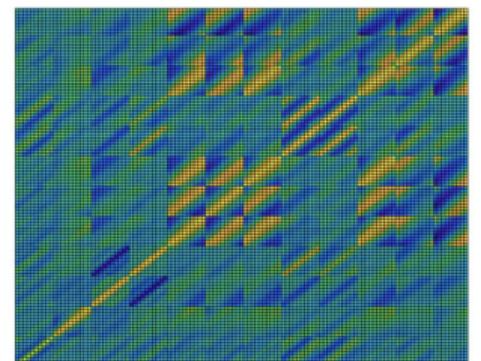
 30% Healthy control

 70% Patients

 Irrelevant information included



(c)



(d)

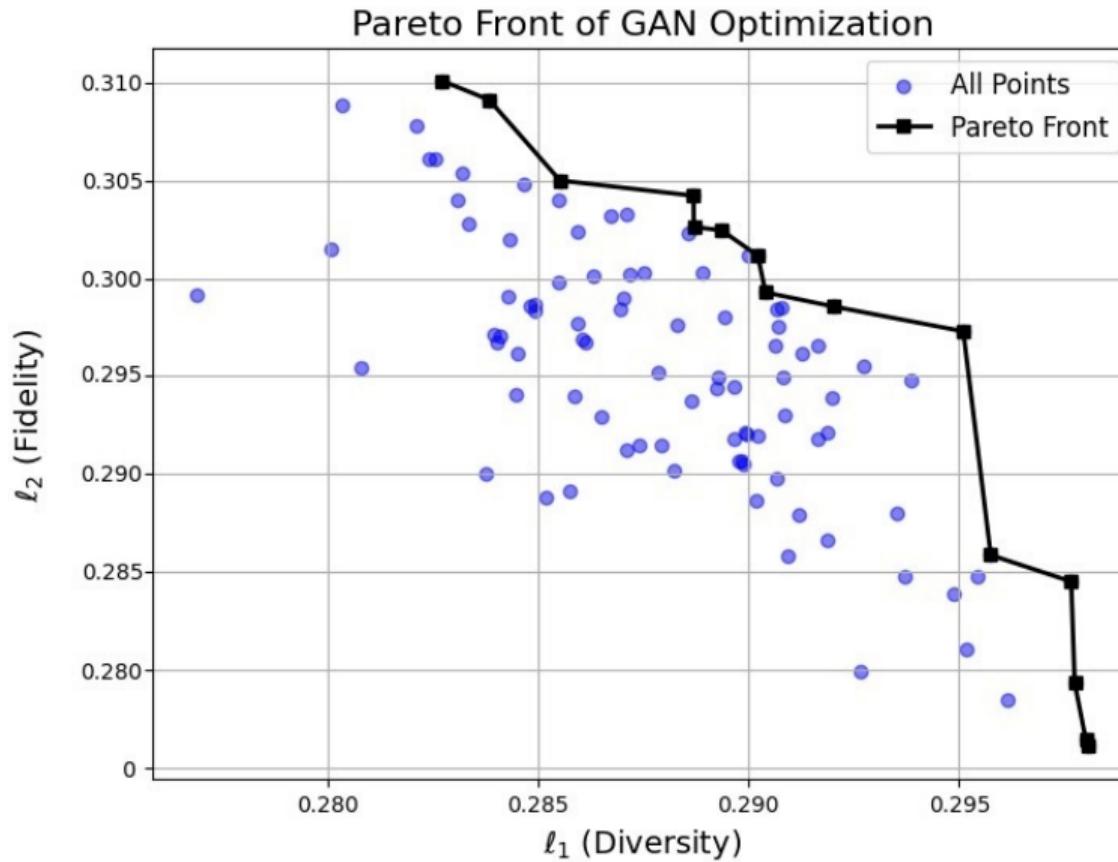
AI Decisional Support



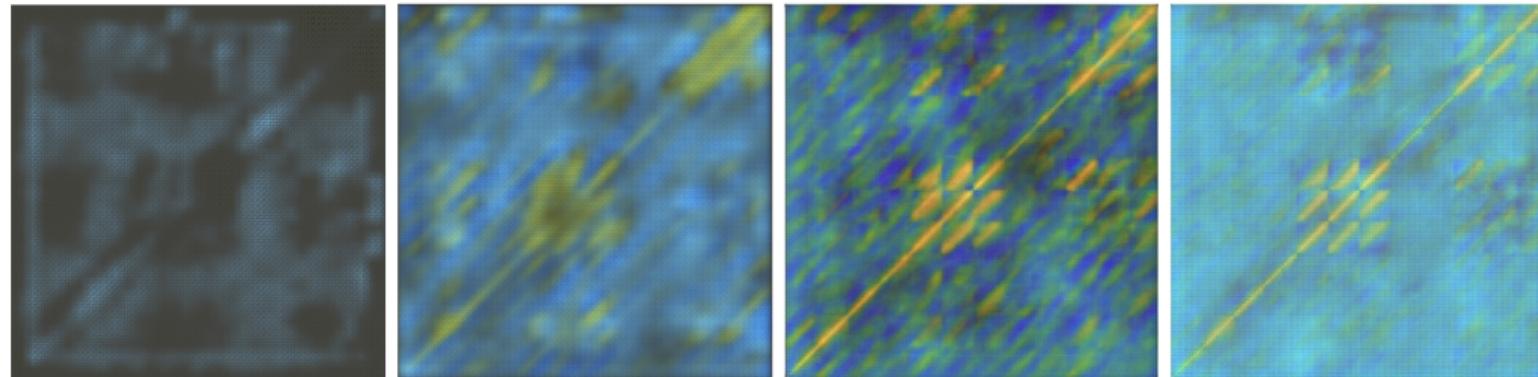
PAERKINSON-NET ARCHITECTURE

97% ACCURACY

Training metrics



Evolution



Epoch 50

Epoch 140

Epoch 350

Epoch 790

Results

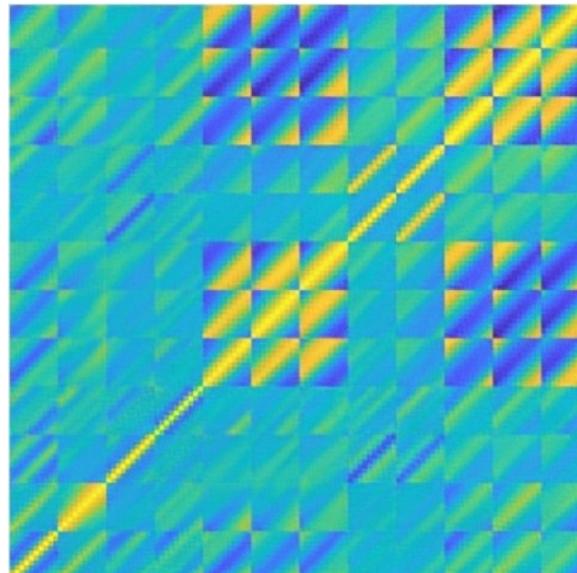


Figure: Results after 40000 epochs