

Part 4/6: Key Challenges

## Mode Collapse

### Output Diversity Comparison

✓ Healthy: Diverse Outputs



△ Partial Collapse



X Complete Collapse



### Problem Description

- Limited variety of samples
- Entire noise → few modes
- Poor gradient signals

### Types of Collapse

**Partial Collapse**  
Missing some data modes

**Complete Collapse**  
Single output regardless of input

### Solutions

Minibatch Discrimination      Unrolled GANs

Feature Matching      Diversity Penalties