Network Architectures

2D Flow Prediction Network

Boundary → D-Res 3x3 → Flow

Start filter size 8

D-Res 3x3 → D-Res 3x3 → D-Res 3x3 → D-Res 3x3 → D-Res 3x3 → D-Res 3x3 → Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → Conv 3x3 → Flow

Set Flow to zero on boundary

3D Flow Prediction Network

Boundary → D-Res 3x3x3 → Flow

Start filter size 8

D-Res 3x3x3 → D-Res 3x3x3 → D-Res 3x3x3 → D-Res 3x3x3 → Res 3x3x3 → U-Res 3x3x3 → U-Res 3x3x3 → U-Res 3x3x3 → U-Res 3x3x3 → U-Res 3x3x3 → Conv 3x3x3 → Flow

Set Flow to zero on boundary

Heat Prediction Network

Boundary → D-Res 3x3 → Heat

Start filter size 4

D-Res 3x3 → D-Res 3x3 → D-Res 3x3 → D-Res 3x3 → Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → Conv 3x3 → Heat

2D Flow Parameterization Network

Params → FC → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → Conv 3x3 → Pad 128x128 → Boundary

Reshape FC layer to 2x2x512

Pad zeros to get to 512x512

3D Flow Parameterization Network

Params → FC → U-Res 3x3x3 → U-Res 3x3x3 → U-Res 3x3x3 → U-Res 3x3x3 → U-Res 3x3x3 → Conv 3x3x3 → Pad 24x24x24 → Boundary

Reshape FC layer to 3x3x3x128

Pad zeros to get to 144x144x144

Heat Parameterization Network

Params → Fully Con → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → U-Res 3x3 → Conv 3x3 → Boundary

Reshape FC layer to 2x2x256

| D-Res | — Res block followed by a Downsample Res block that doubles filter size |

| U-Res | — Res block followed by a Transpose Conv that halves filter size |