Spider-Net: Supplementary Materials

1 Final Model Architectures

This section will display examples of the complex architectures produced by the composition of mutations and pruning. Figure 1 shows a random model created by choosing 45 random mutations and random intercycle pruning. Meanwhile, Figure 2 shows a SpiderNet model created by 45 NTK-LRC guided mutations and inter-cycle pruning via differentiable pruners. Notice that as compared to the random model, SpiderNet ensures that the input nodes arrive very early into the cell, never later than the third node. Additionally, SpiderNet produces lower-node count cells than that of the random models despite having an equivalent number of mutation opportunities; the SpiderNet model has 13, 16, and 11-node cells, while the random model has 16, 18, and 19-node cells. This is a visual demonstration of the SpiderNet's efficiency, in its ability to produce superior models to random search in significantly smaller amounts of VRAM space and parameter count.
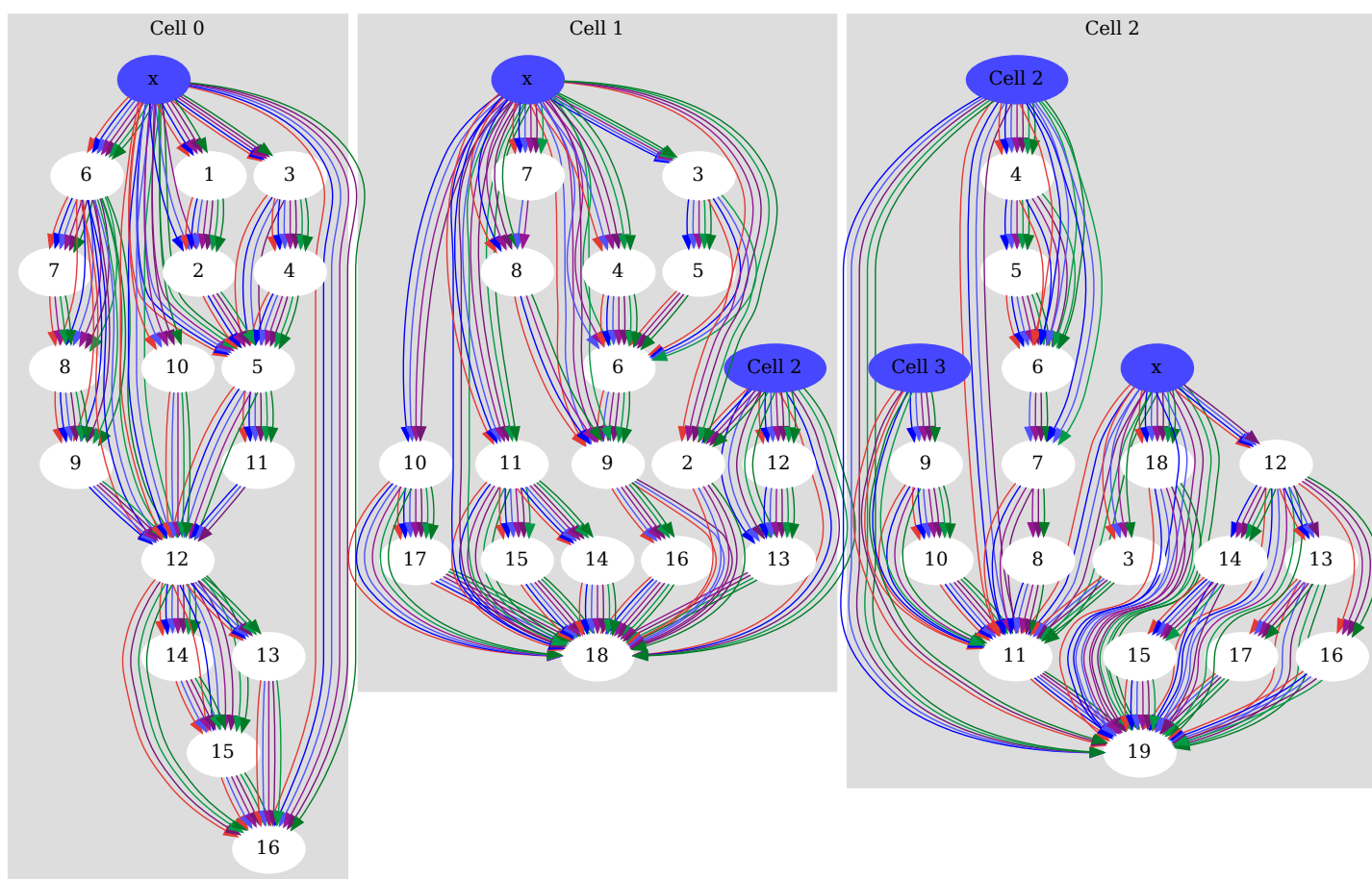
Random Model

Figure 1: A sample SpiderNet model after 45 random mutation attempts and random pruning. Cellular inputs are shown in blue.
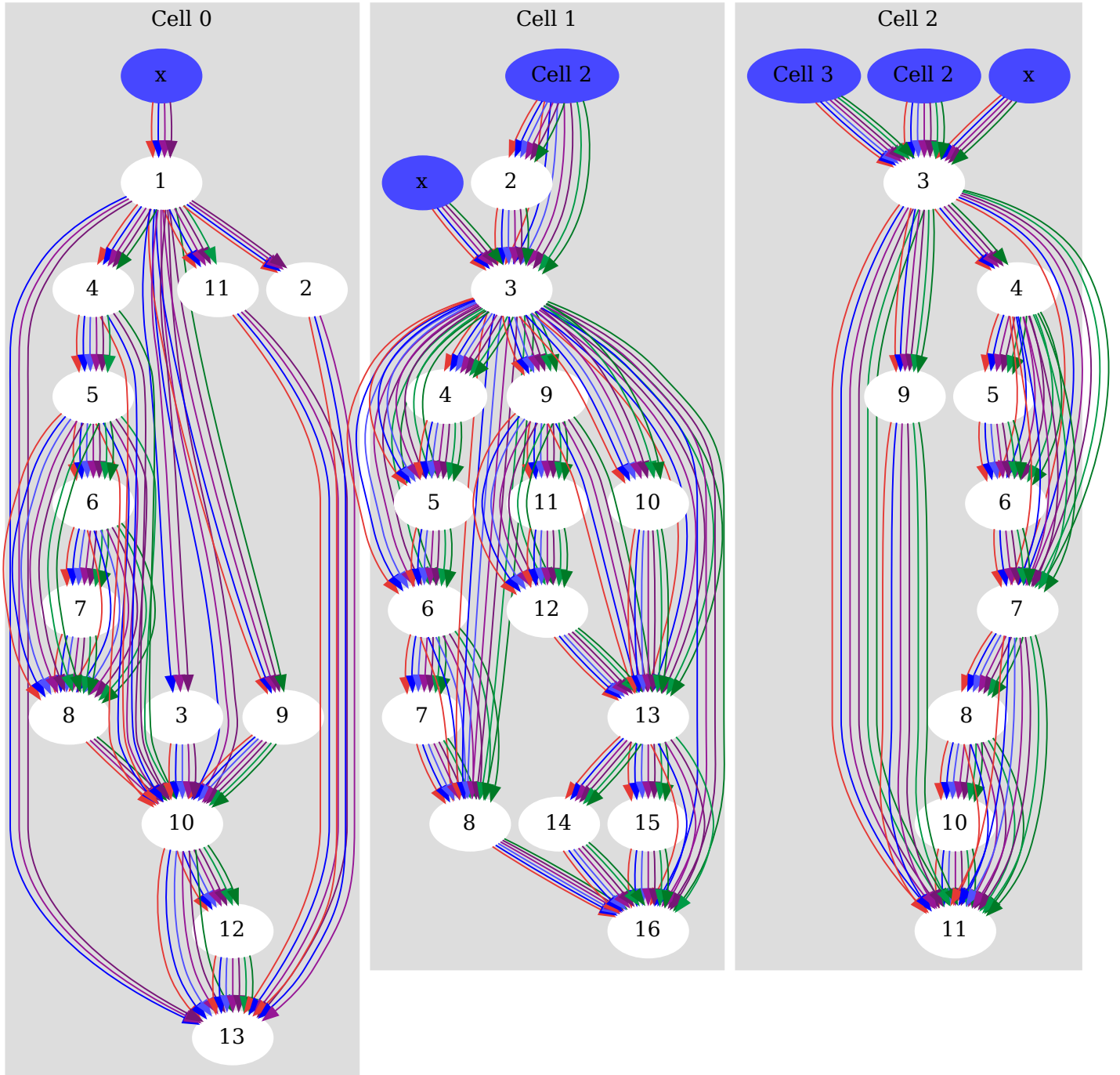
Figure 2: A SpiderNet model after 45 NTK-LRC guided mutation attempts and guided inter-cycle pruning. Cellular inputs are shown in blue.