International Institute of Information Technology Bangalore

Micron – IIITB Presentation

Date: April 16th, 2024

By:

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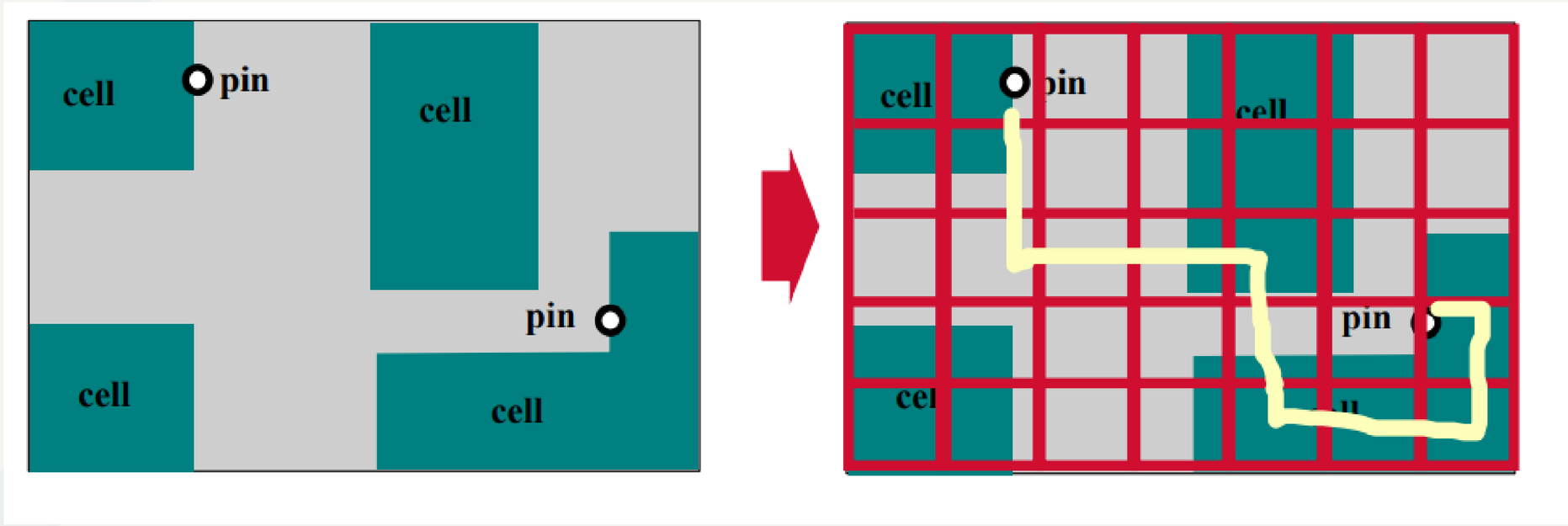
Agenda

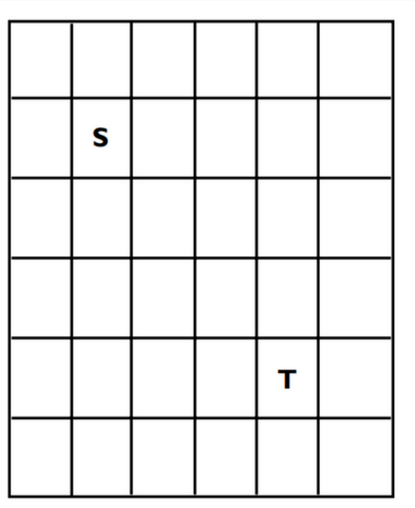
- Multi-Node Multi-Layer Routing
- New Parser Design
- New UI Interface for Placement Output Viewing
- Added custom modifications to routing flow

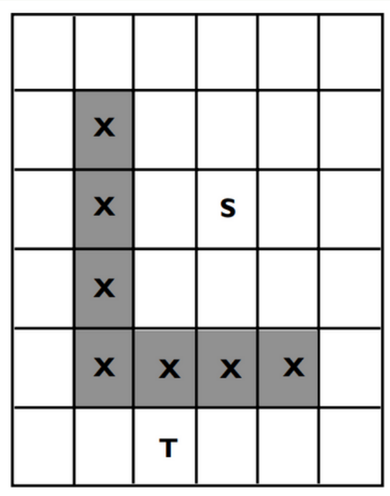
Routing Algorithms



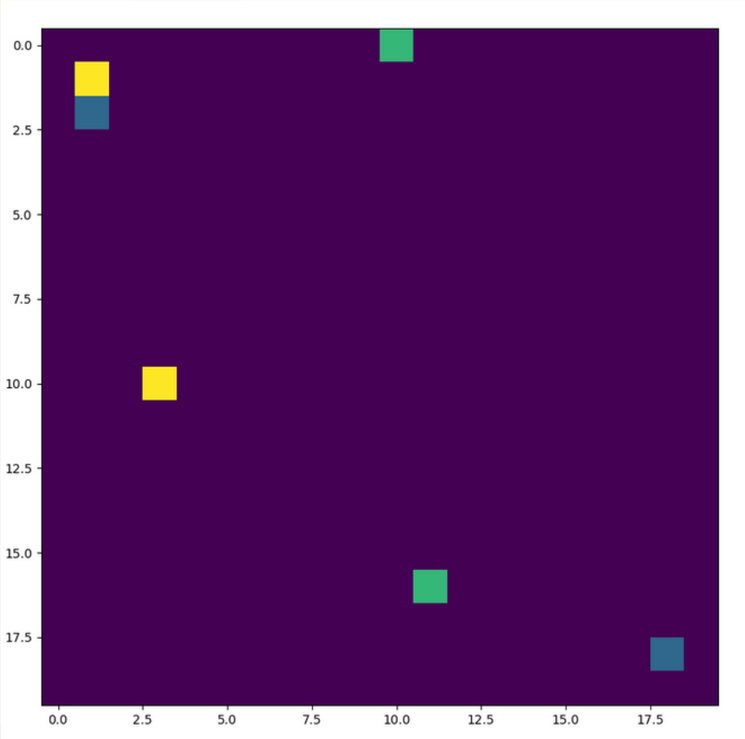
Routing Algorithms

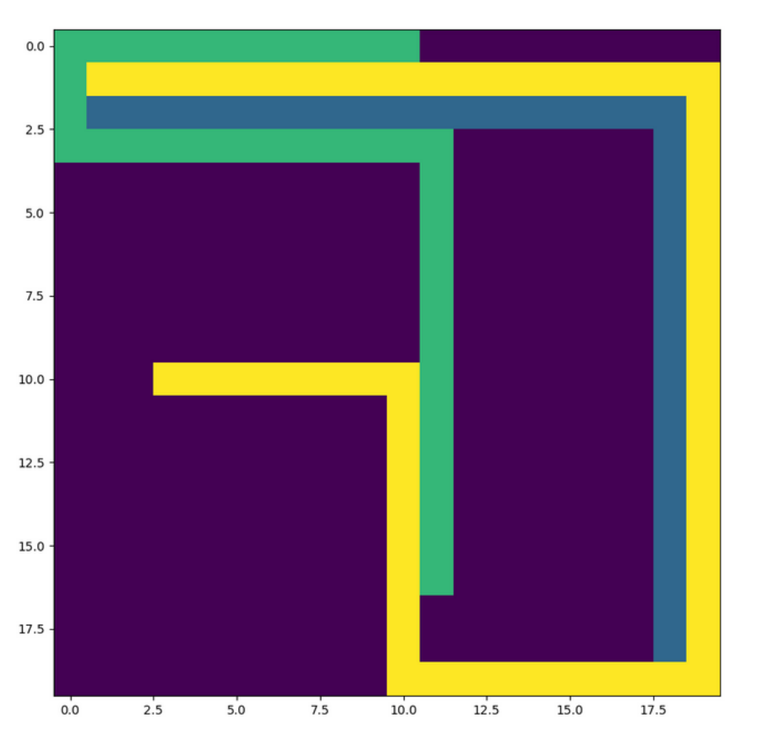
- Maze Routing for solving:
  - Uses Lee’s Algorithm for finding shortest paths between two points in grid.



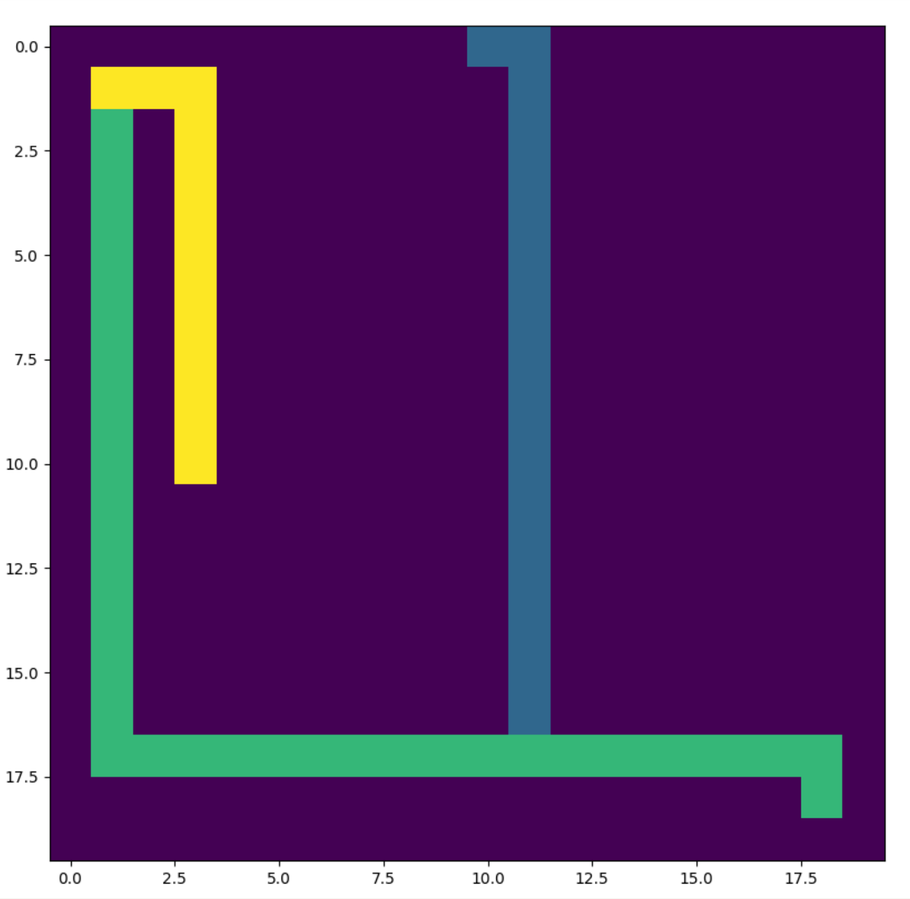


Routing Algorithms



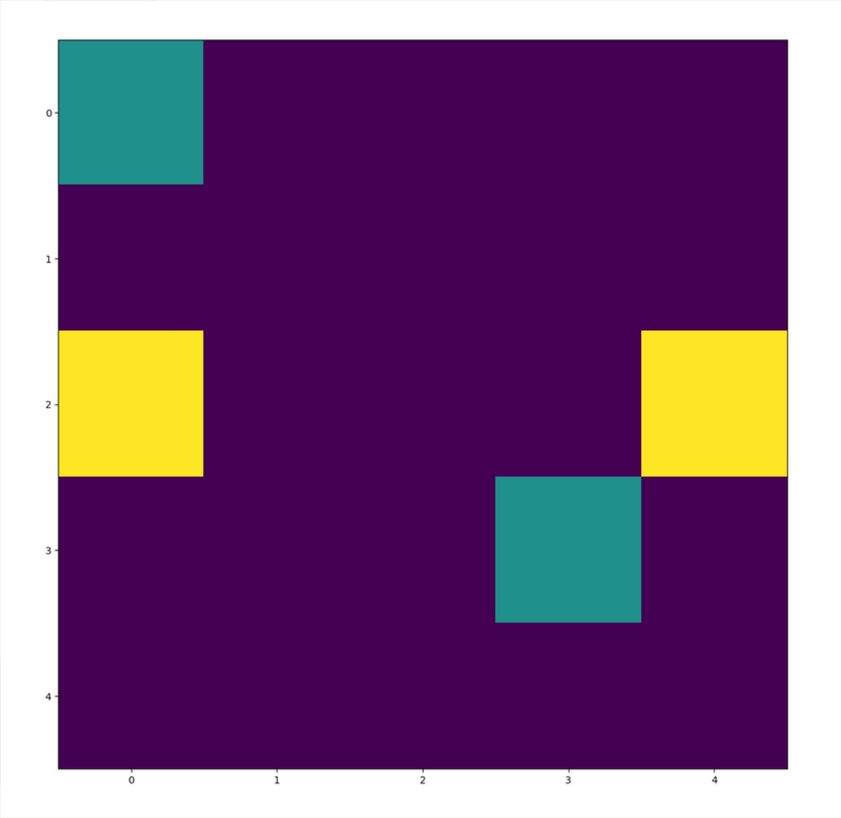


Routing Algorithms

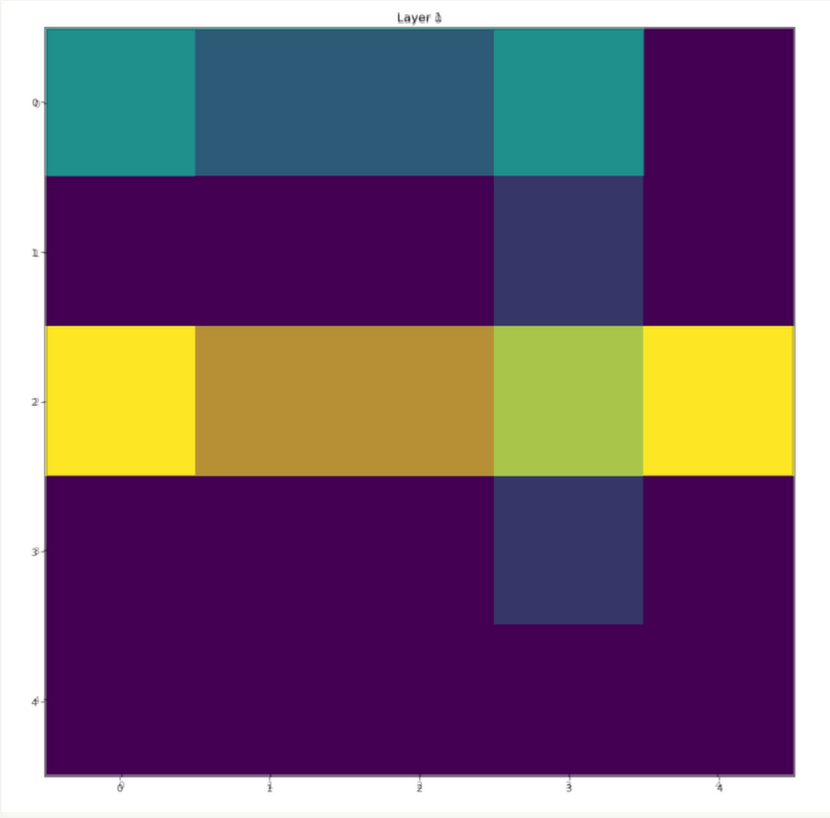


Routing Algorithms

Pin Placement

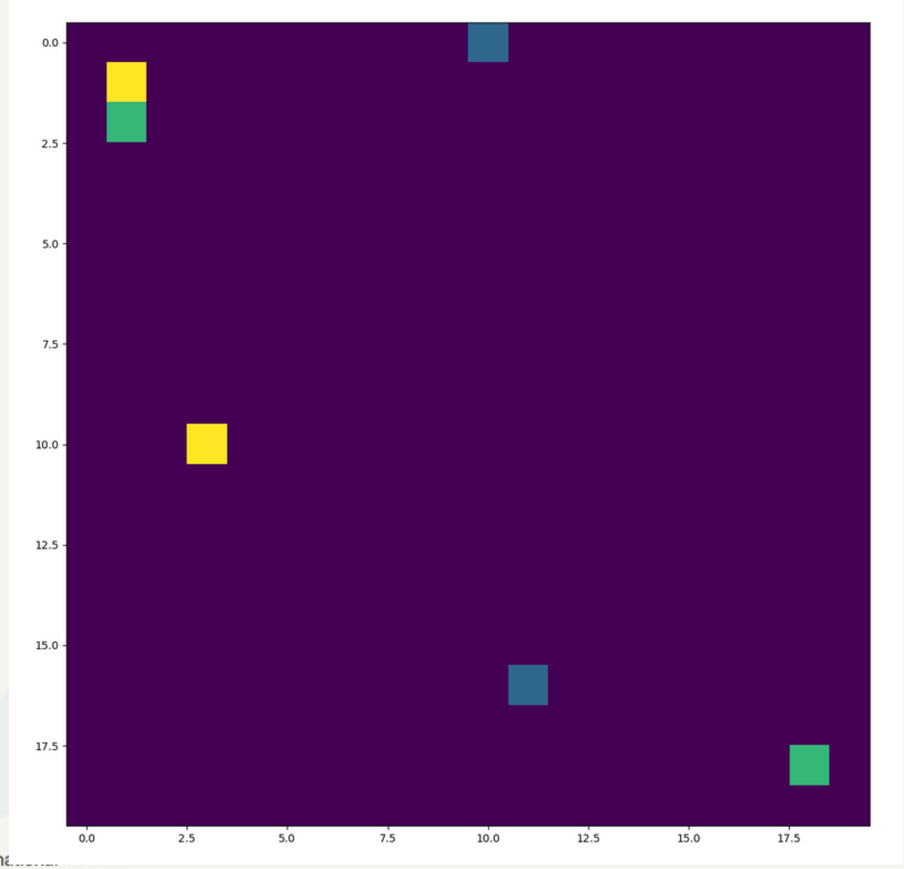


Multi-Layer Routing

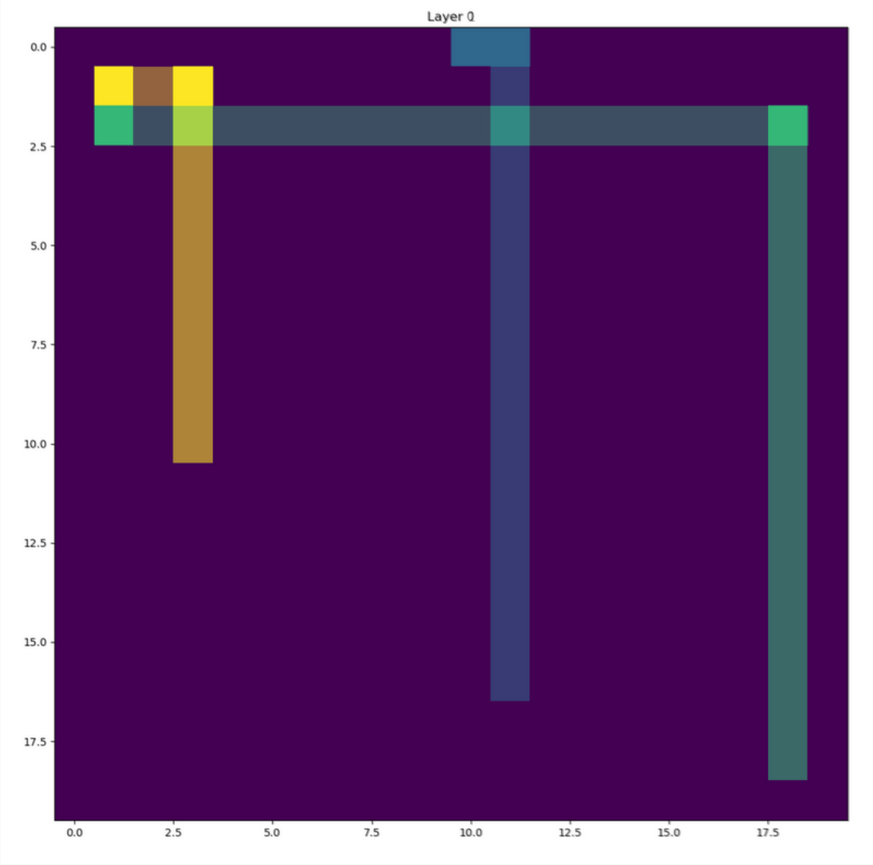


Routing Algorithms

Pin Placement

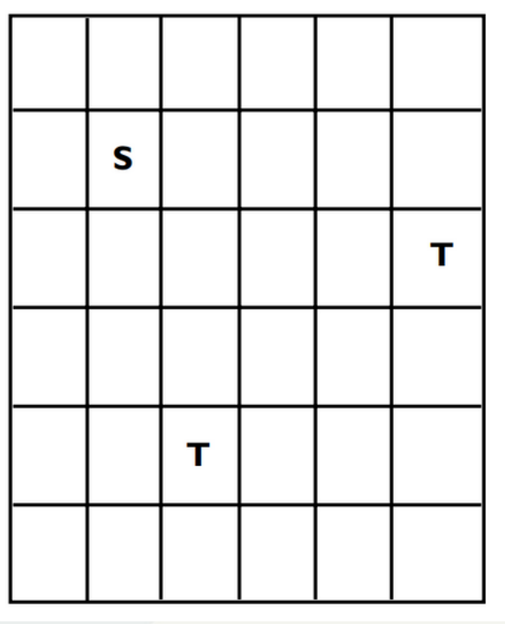


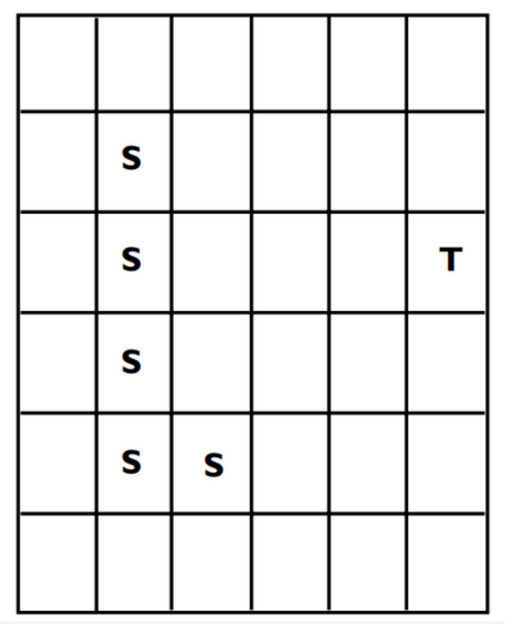
Multi-Layer Routing

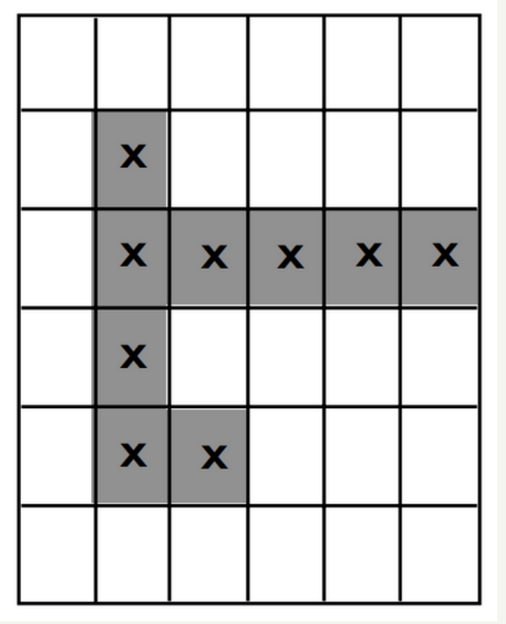


Routing Algorithms (Multiple Nodes in a Net)

- Expand -> Backtrace -> Cleanup

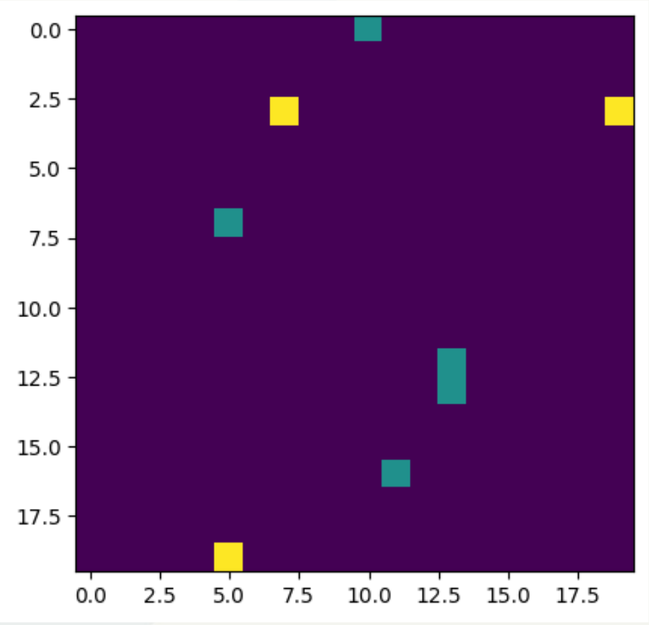


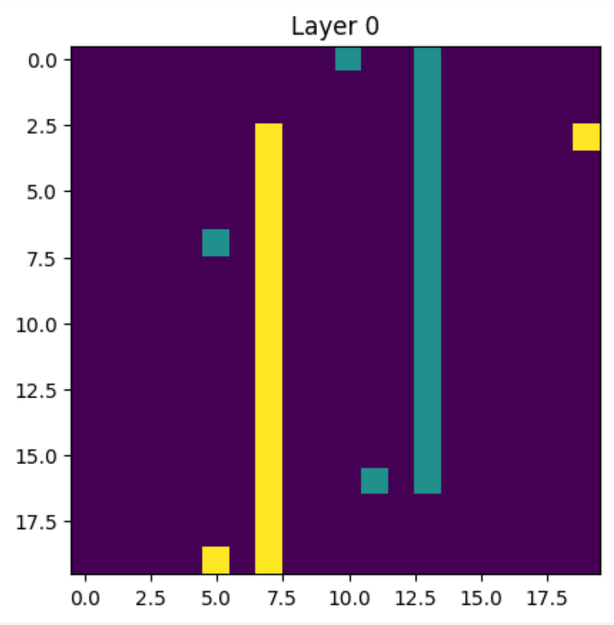


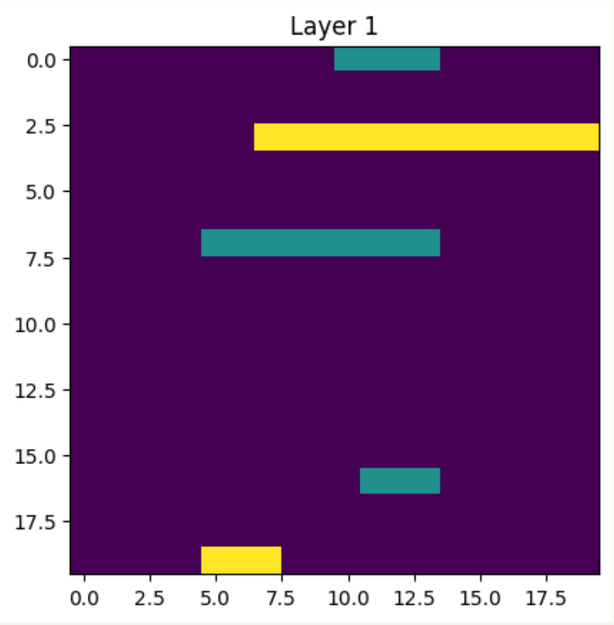


Routing Algorithms (Example)

- Expand -> Backtrace -> Cleanup







Routing Algorithms (Example)

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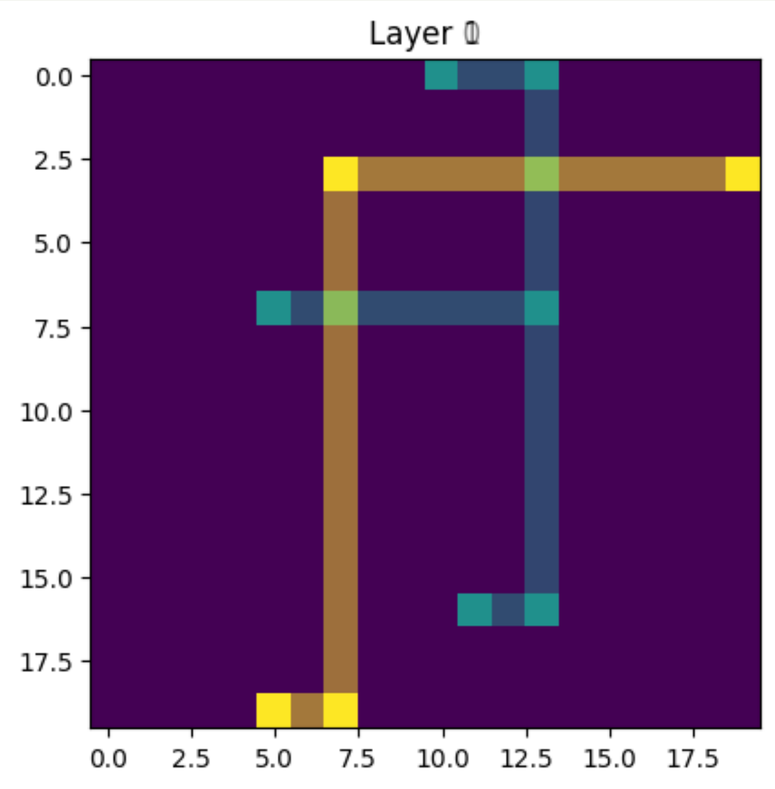
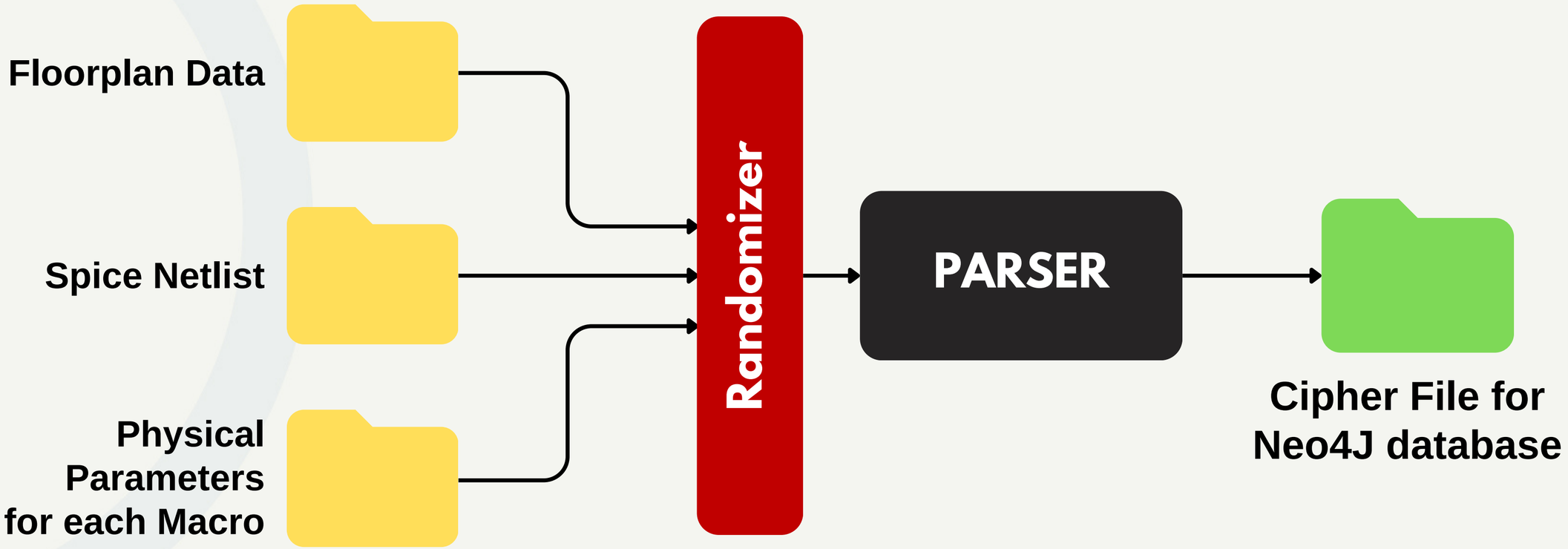


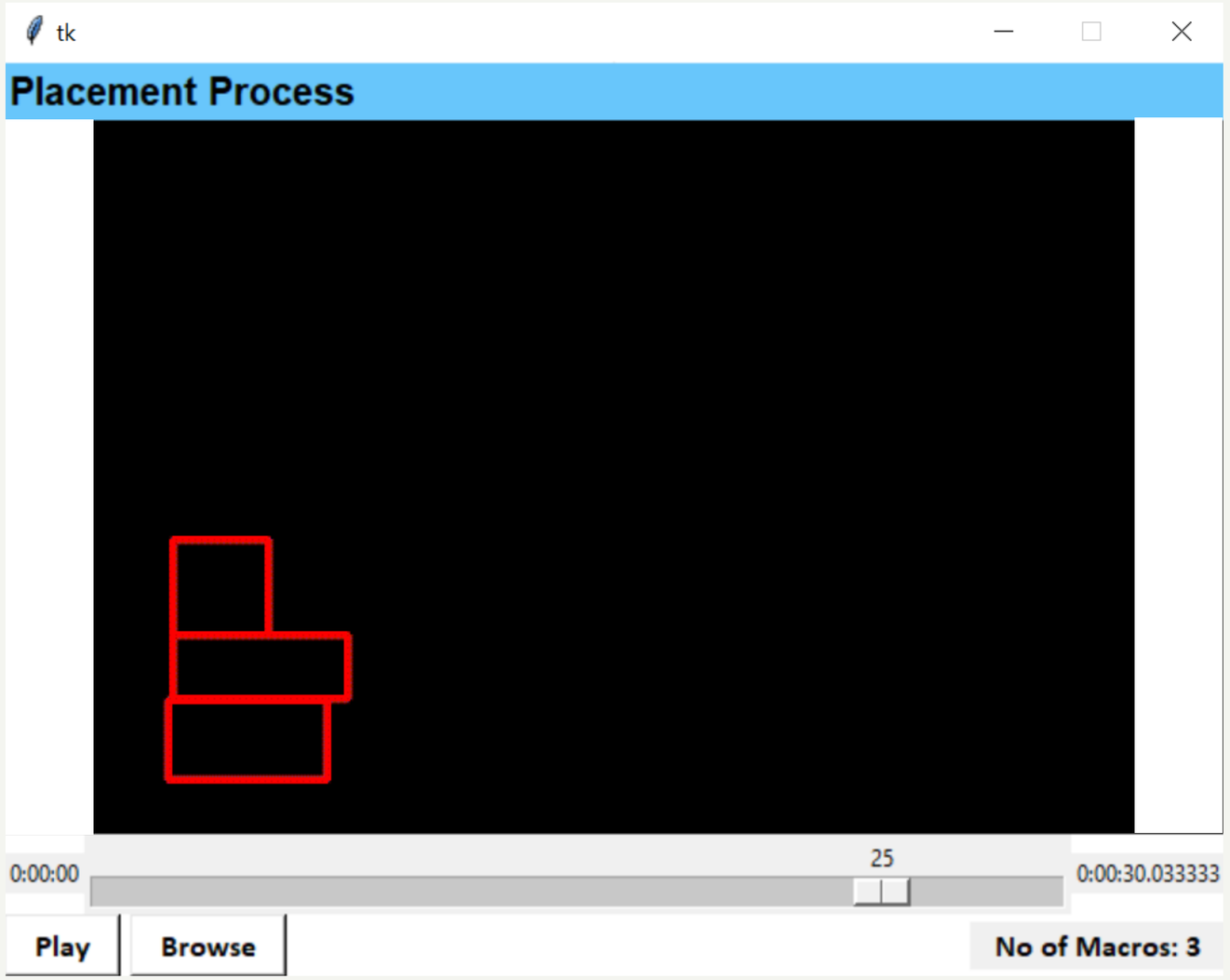
New Parser Design



New Parser Design

- The external files to be included in the parser have been implemented.
- Now there is a need to automate this process to have numerous datasets for the Machine Learning algorithms and later for RL-based approach.
- To do this, we are currently implementing a randomizer that generates designs randomly by seamlessly connecting one macro to the other.
- One difficulty that we are currently facing is extracting information about the pins on the macro, these details are not mentioned in the dataset, so we are currently working on this.

New Visualizer



New Visualizer

- The placement visualizer is a tool to provide a user interface so that we can check how many macros are placed and how the algorithm runs.
- The visualizer is currently in a very primitive stage, but we plan to add more features and integrate it with the placement algorithm so that it runs in real time.
- The browse button allows us to load a file in the player and see how macros move randomly in the space to align themselves on the floorplan.
- Currently the floorplan is fixed at 800x800
- Macros are scaled as per floorplan size.

Summary of overall Progress

- We implemented the multi-layer routing with multi-node terminals, i.e., from one source to multiple nodes.
- The parser with initial configurations is ready, adding a randomizer for larger data set collection.
- A visualization tool was realized so that placement macros can be seen on the floorplan
- The current plan for the next few weeks is to finalize the model for Phase 2

Any specific request to Micron

None for now