International Institute of Information Technology Bangalore

Micron – IIITB Presentation

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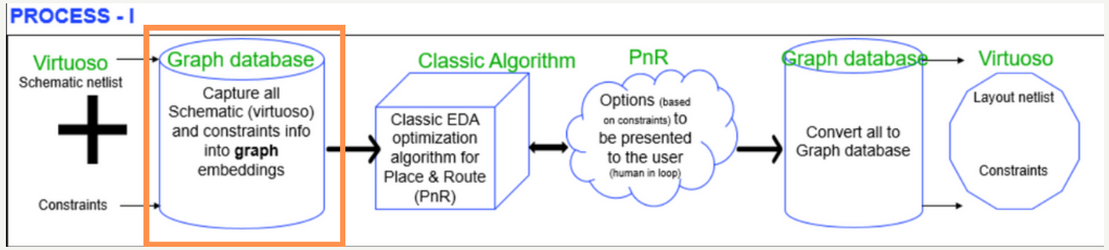
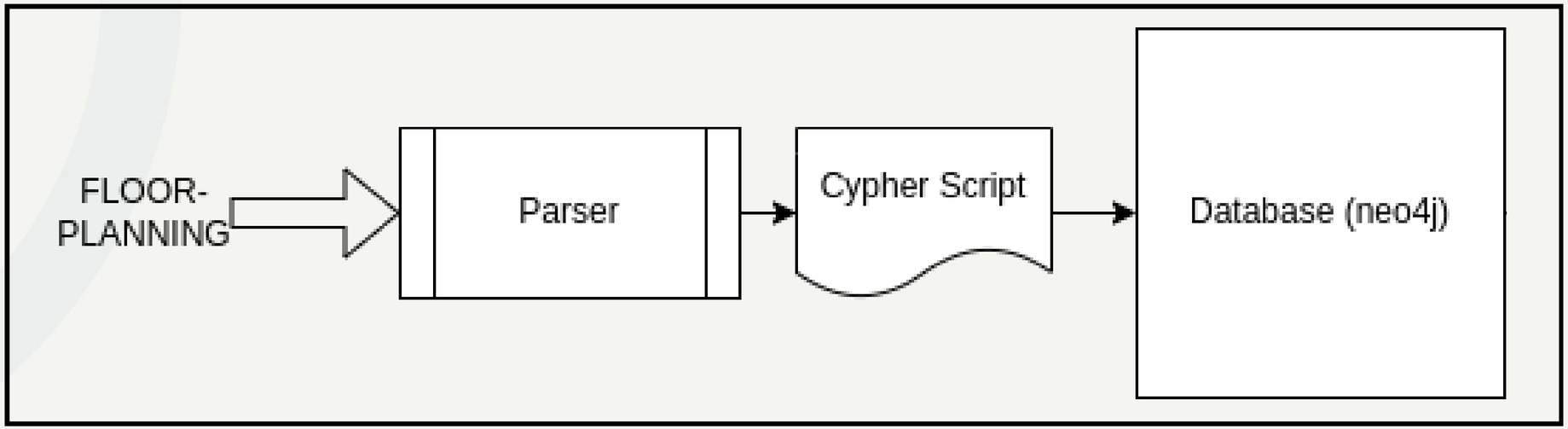
Agenda

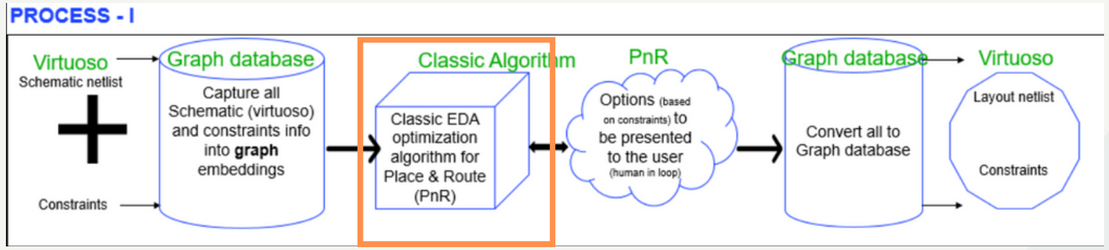
- Graph database generation
- Placement Algorithms
- Mixed-Signal designs
- OP-amp, DAC circuitry

Graph database Generation





Placement Algorithms



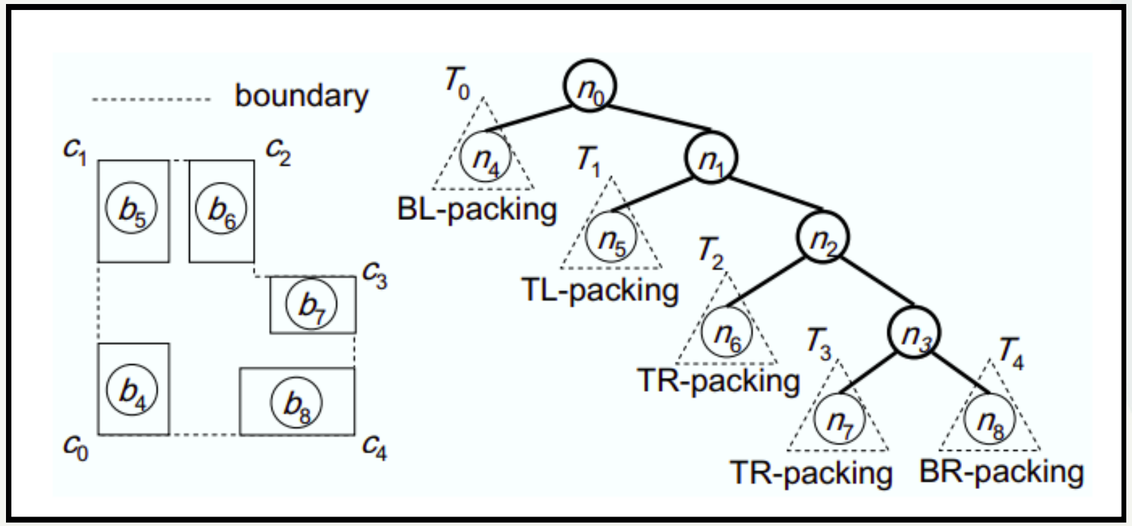
- **Placement Algorithms classified as either :**
  - **Constructive Algorithms:** Each module is placed individually.
  - **Iterative Algorithms:** All modules are placed at once and the positions are improved in every iteration.

Placement Algorithms

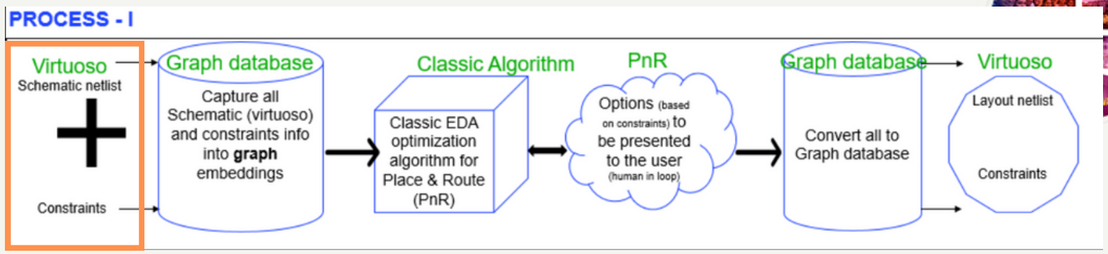
- **Constructive Algorithms :**
  - **Pair-Linking:** Module with highest connections to one of the already placed modules, is placed first. Higher priority modules are placed in centre.
  - **Cluster Development:** Module with highest connections to all of the already placed modules, is placed first.
  - **Minimally Interconnected sub-graph :** Modules are grouped such that the connections between groups are minimised. These groups are then placed one at a time, starting with the largest group

Placement Algorithms

- MP-Tree Algorithm:
  - Divides macros into groups (packings). This information is mapped to a binary tree. These groups are placed in the corners of the floor, giving space for standard cells to be placed.
  - Uses Wirelength, Area used and macro displacement for objective functions

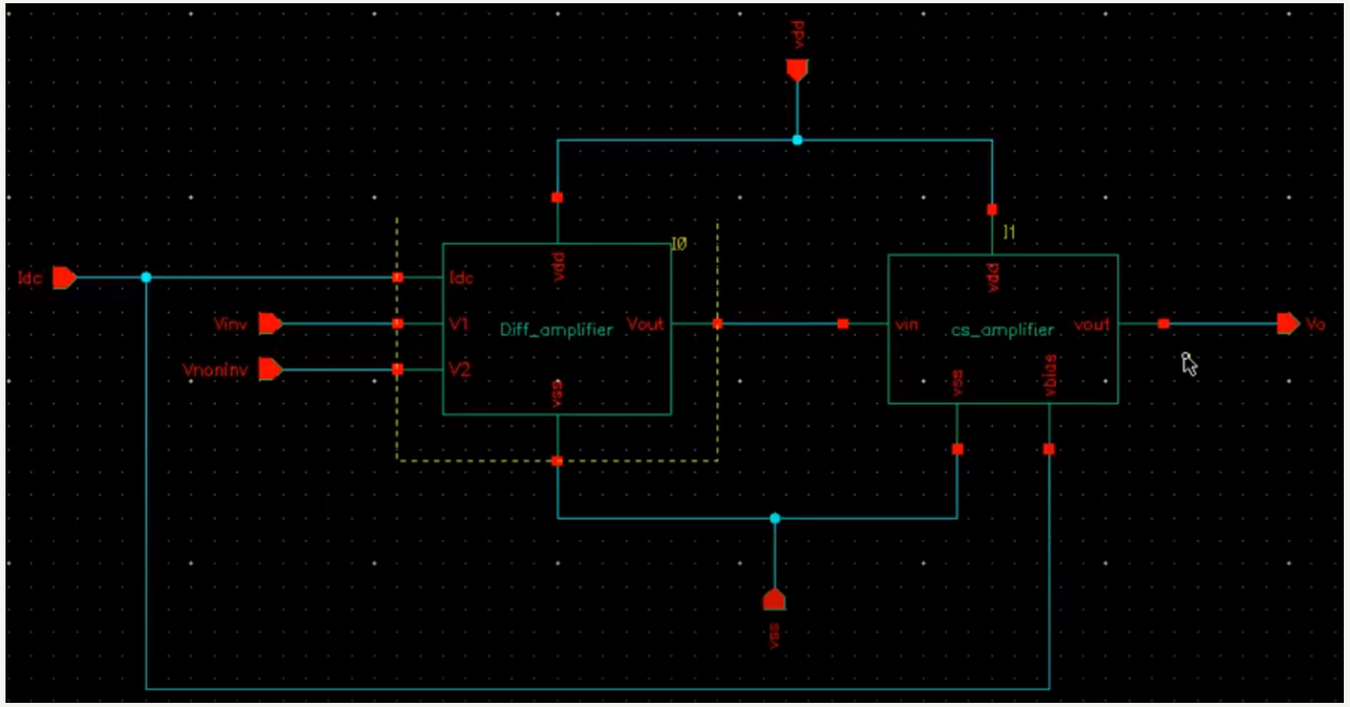


Mixed-Signal designs



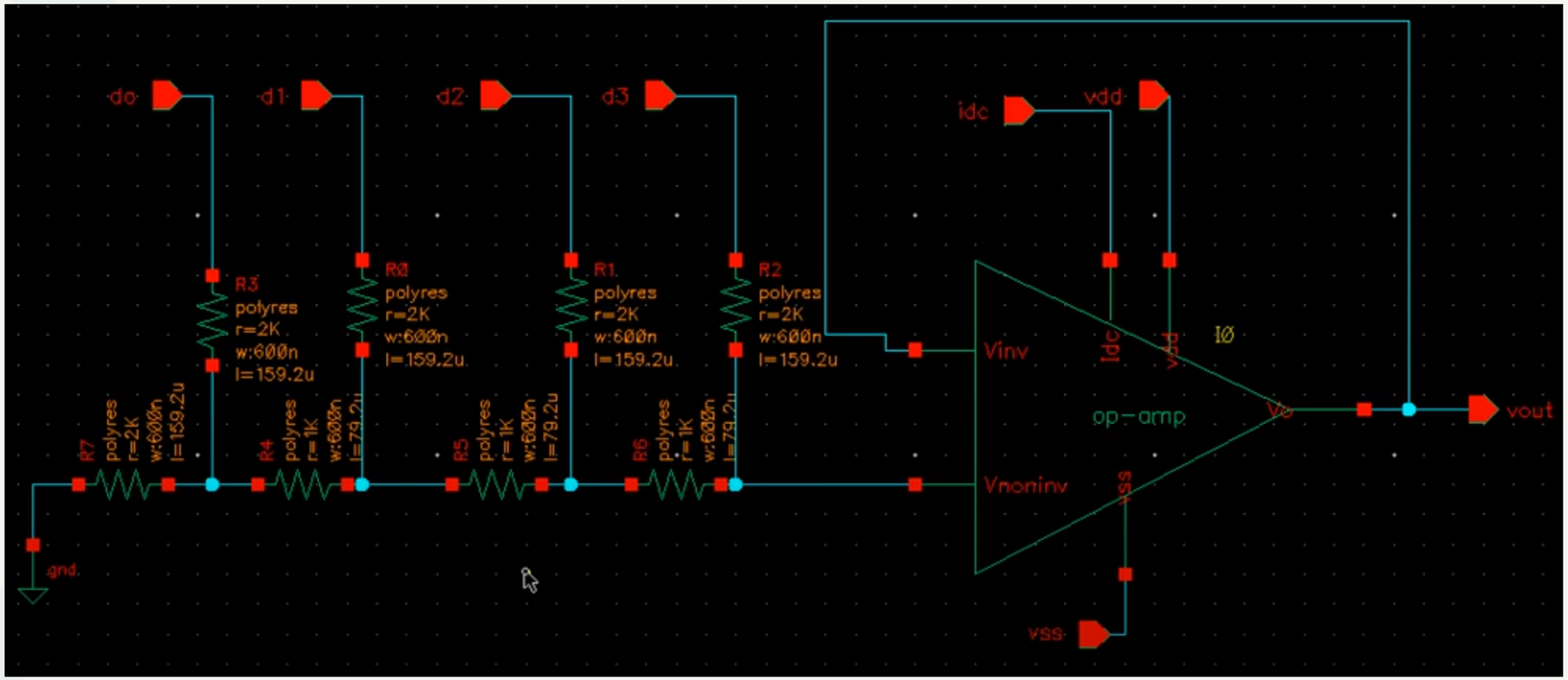
- The basic components of any analog design include ADCs, DACs, OP-amps, AFEs, Memory, PLL, and a few more that form the building blocks of a larger circuitry.
- We are currently exploring the ADCs, DACs, and OP-amps and their circuitry to form larger circuits for the dataset as discussed in the previous meeting.
- When we go for black boxing, here instead of digital gates the basic components form an integral layer of encapsulation to keep the Neo4J database independent of MOS level circuitry.

OP-amp circuitry



Opamp design based on differential amplifier and common source amplifier

DAC circuitry



DAC Circuitry based on OP-amp

Summary of overall Progress

- Explored a few classic PnR algorithms.
- The dataset generation for the mixed signal designs was explored and we are currently making the dataset in Virtuoso.

Any specific request to Micron

- Which placement algorithm to pick and start developing?