Parallel DCEL Construction Report

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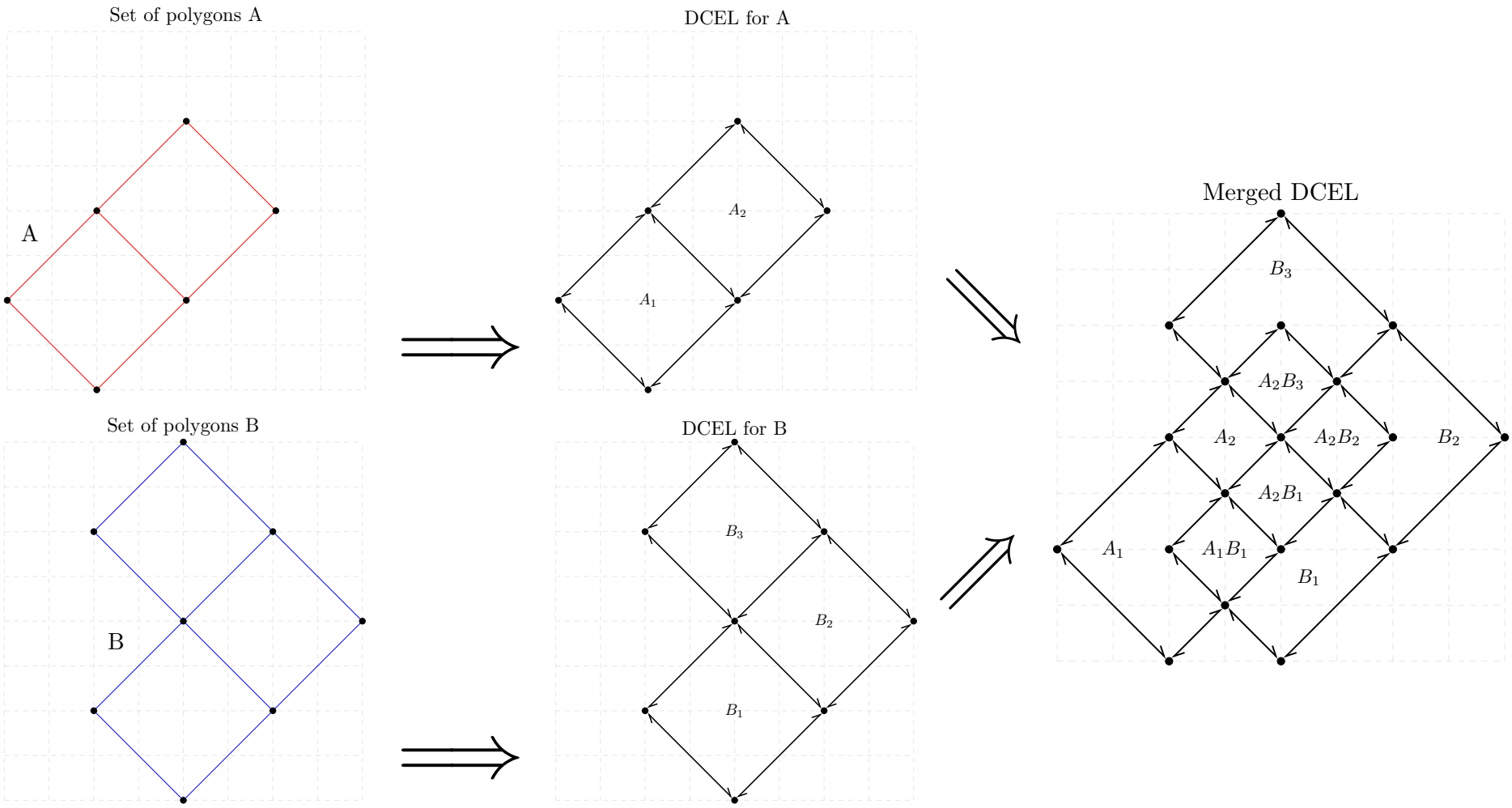
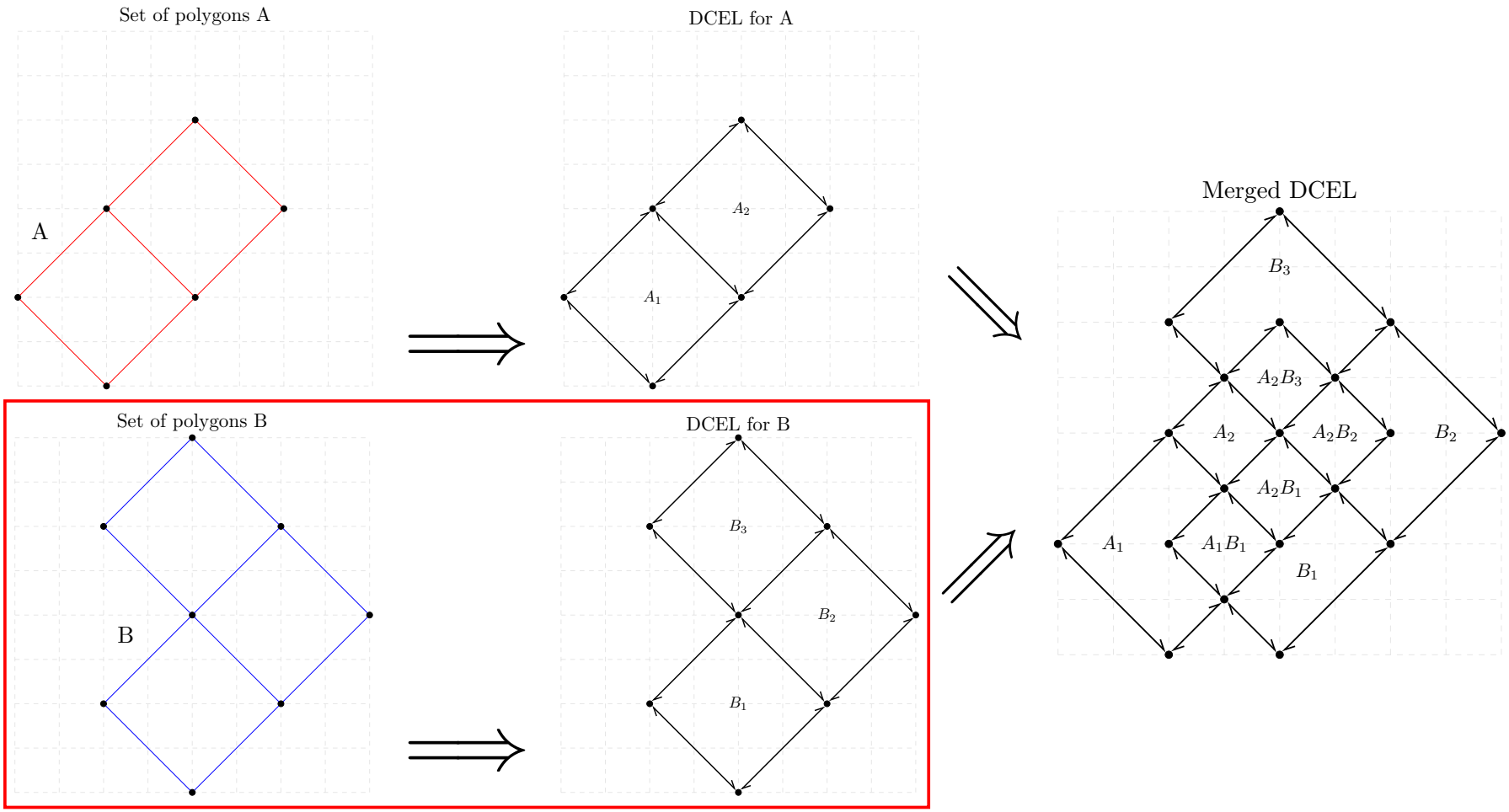
Outline

Overlay operation outline



Overlay operation outline



Outline

Records in the DCEL construction

- Vertex(x: Double, y: Double, edge: Half-edge)
- Half-edge(origen: Vertex, twin: Half-edge, next: Half-edge, prev: Half-edge, face: Face)
- Face(egde: Half-edge, label: String)

DCEL construction outline

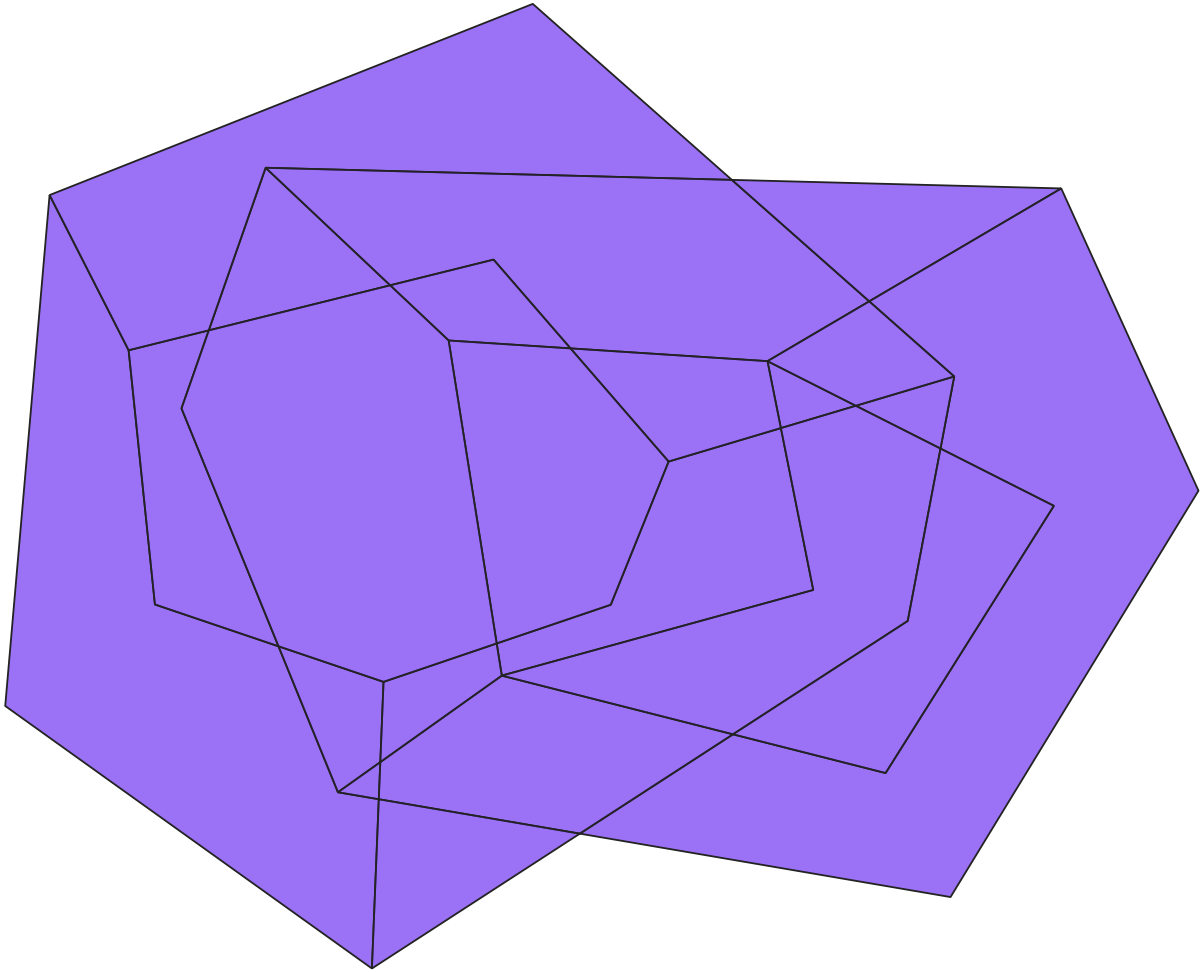
- Input: Set of polygons.
- Output: Dataset of Half-edge records
  1. Read set of polygons
  2. Partition set of polygons according to a grid
  3. For each partition extract its MBR polygon and clip the polygons inside each partition
  4. At each partition built the corresponding DCEL:
     - 4.1 There are two approaches described in [1] and [2]. First one is done, currently working on the second one.
  5. Merge half-edges from each partition

[1] `https://tinyurl.com/y58xk82e`
[2] `https://tinyurl.com/yxnlr5uf`

Outline

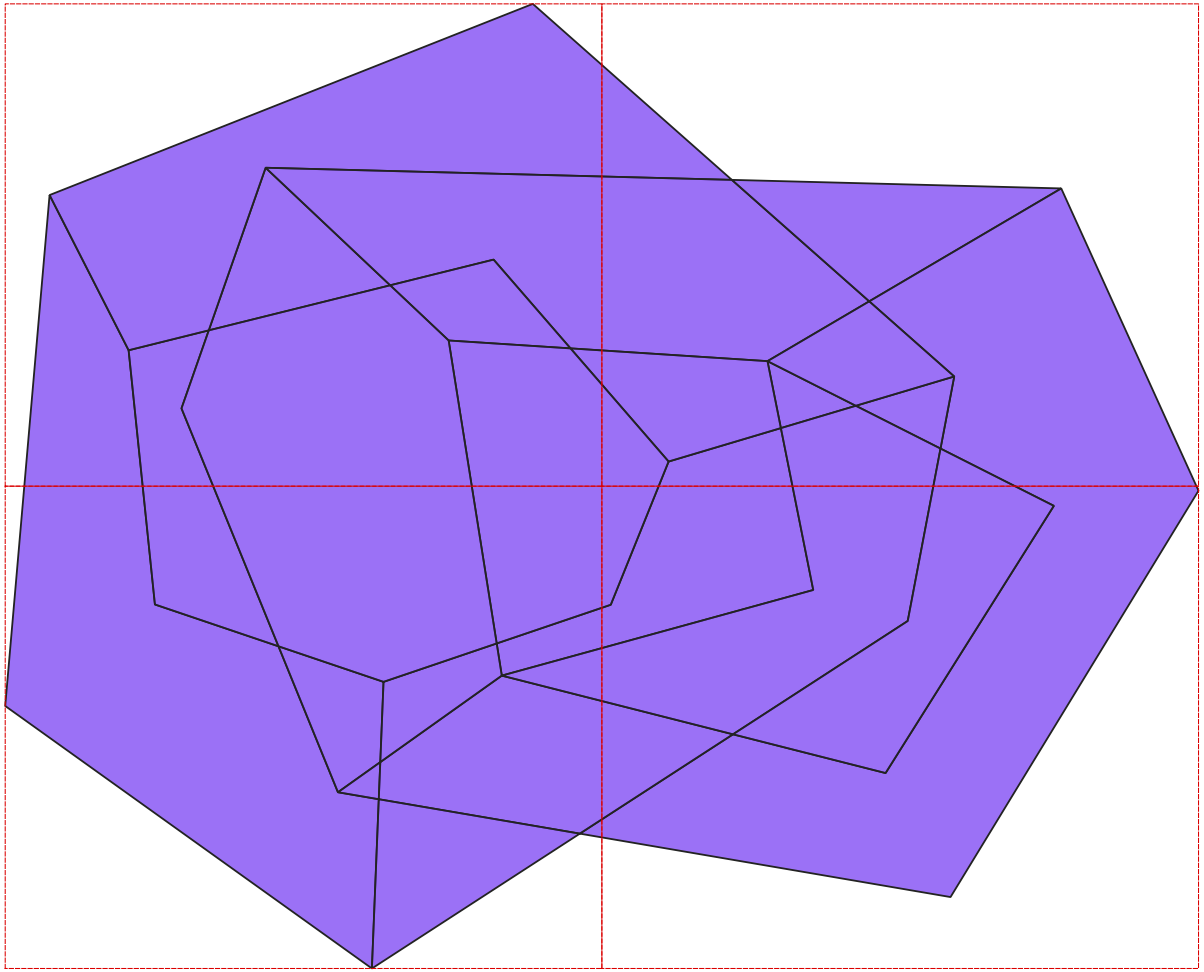
DCEL construction example

Set of polygons



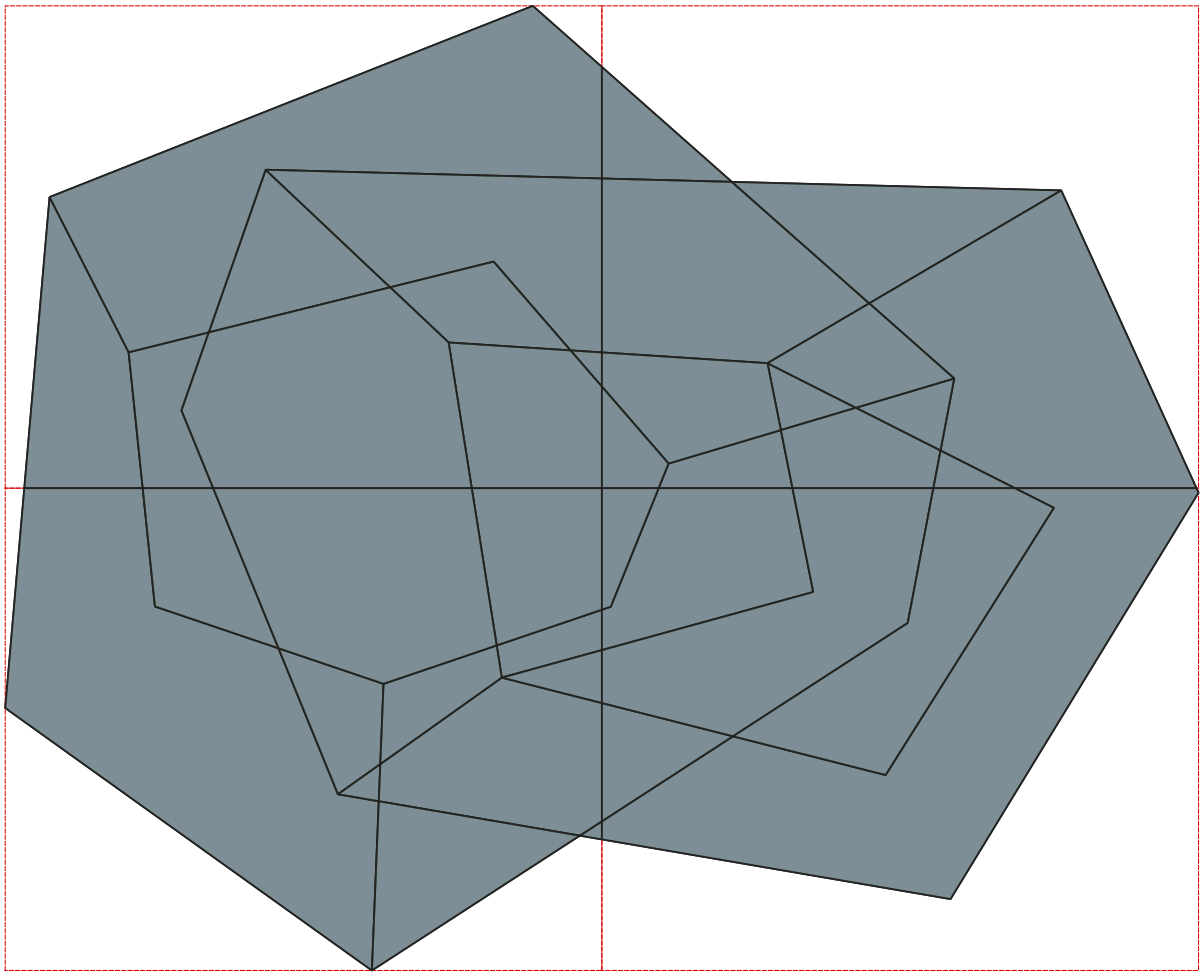
DCEL construction example

Partitioning



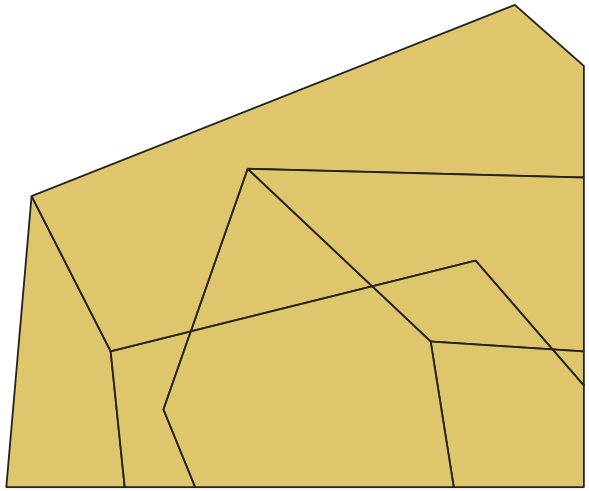
DCEL construction example

Clipping



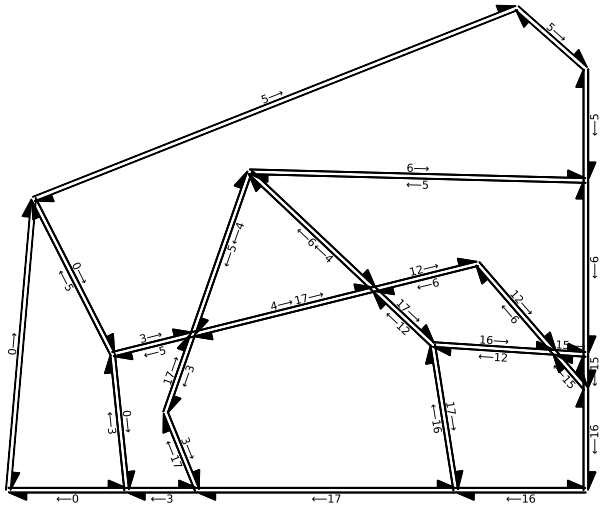
DCEL construction example

Local step input (set of clipped polygons)



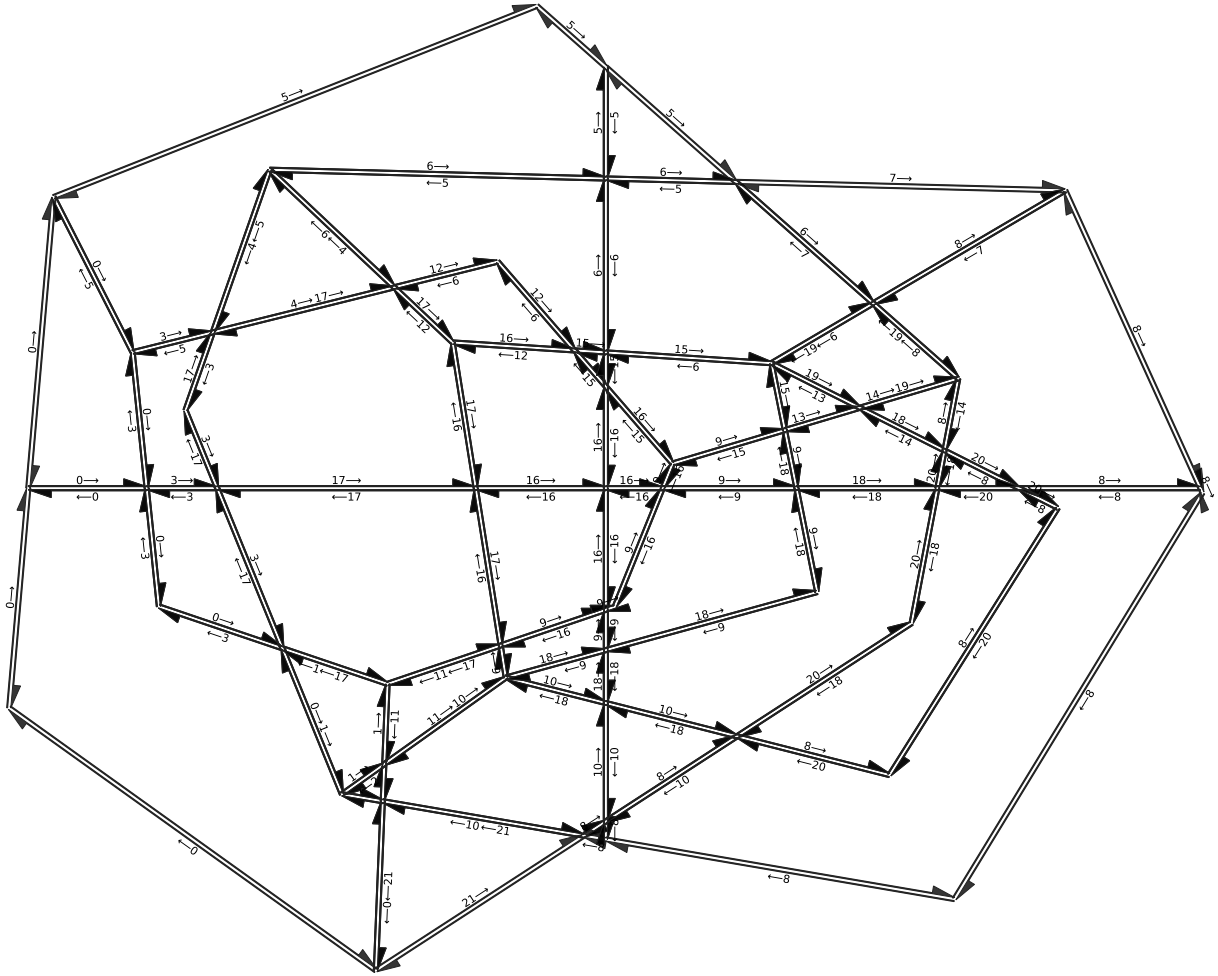
DCEL construction example

Local step output (local DCEL)



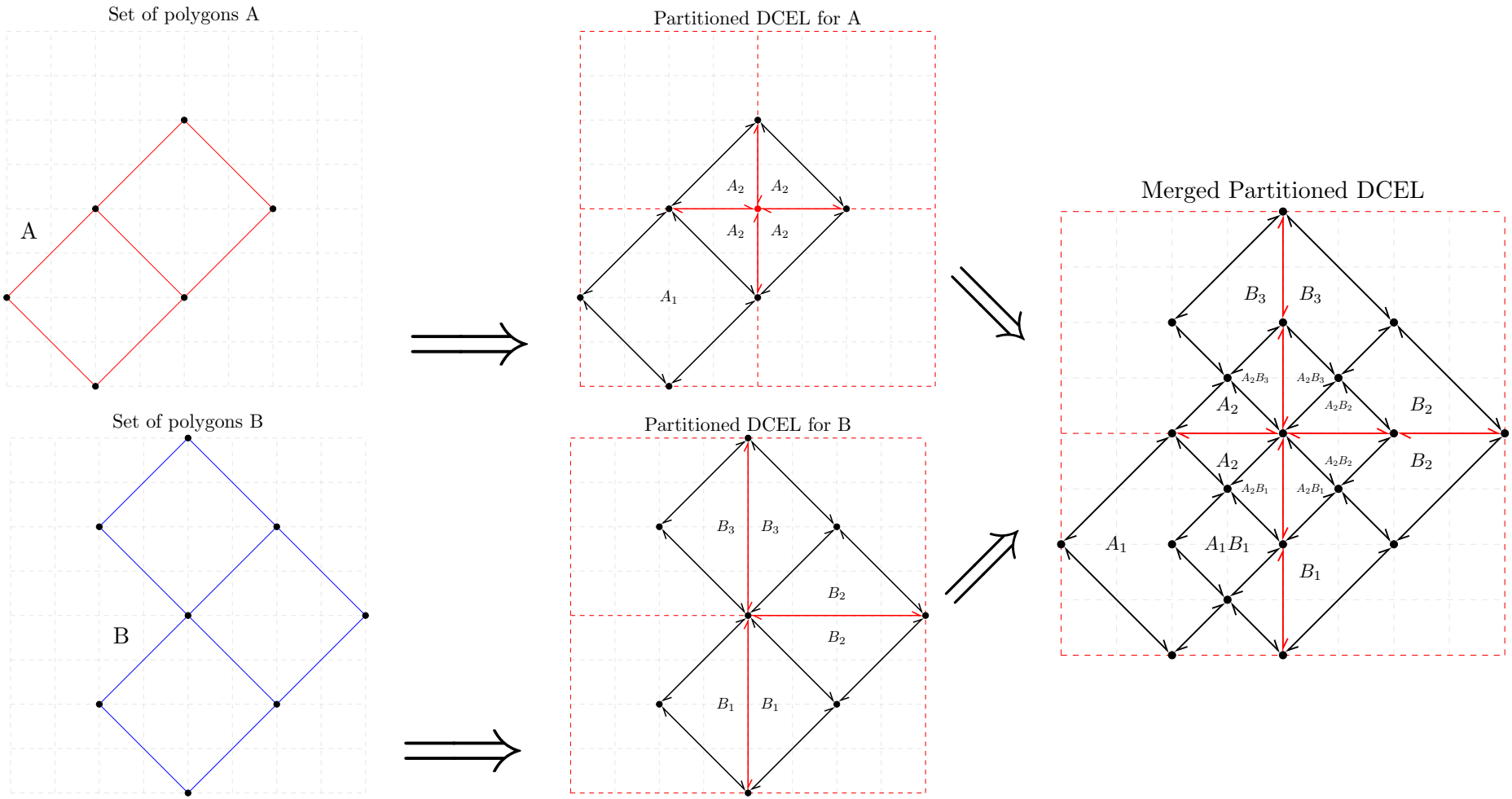
DCEL construction example

Global view (DCELs at each partitions)



Outline

Merge Partitioned DCEL



Partitioned Overlay Operation