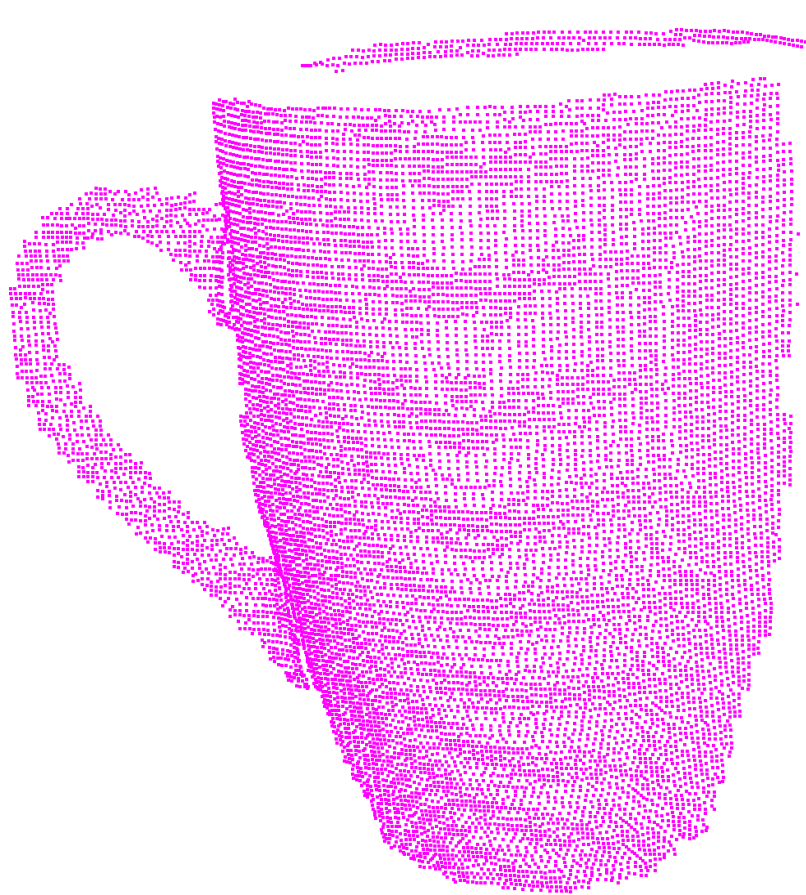
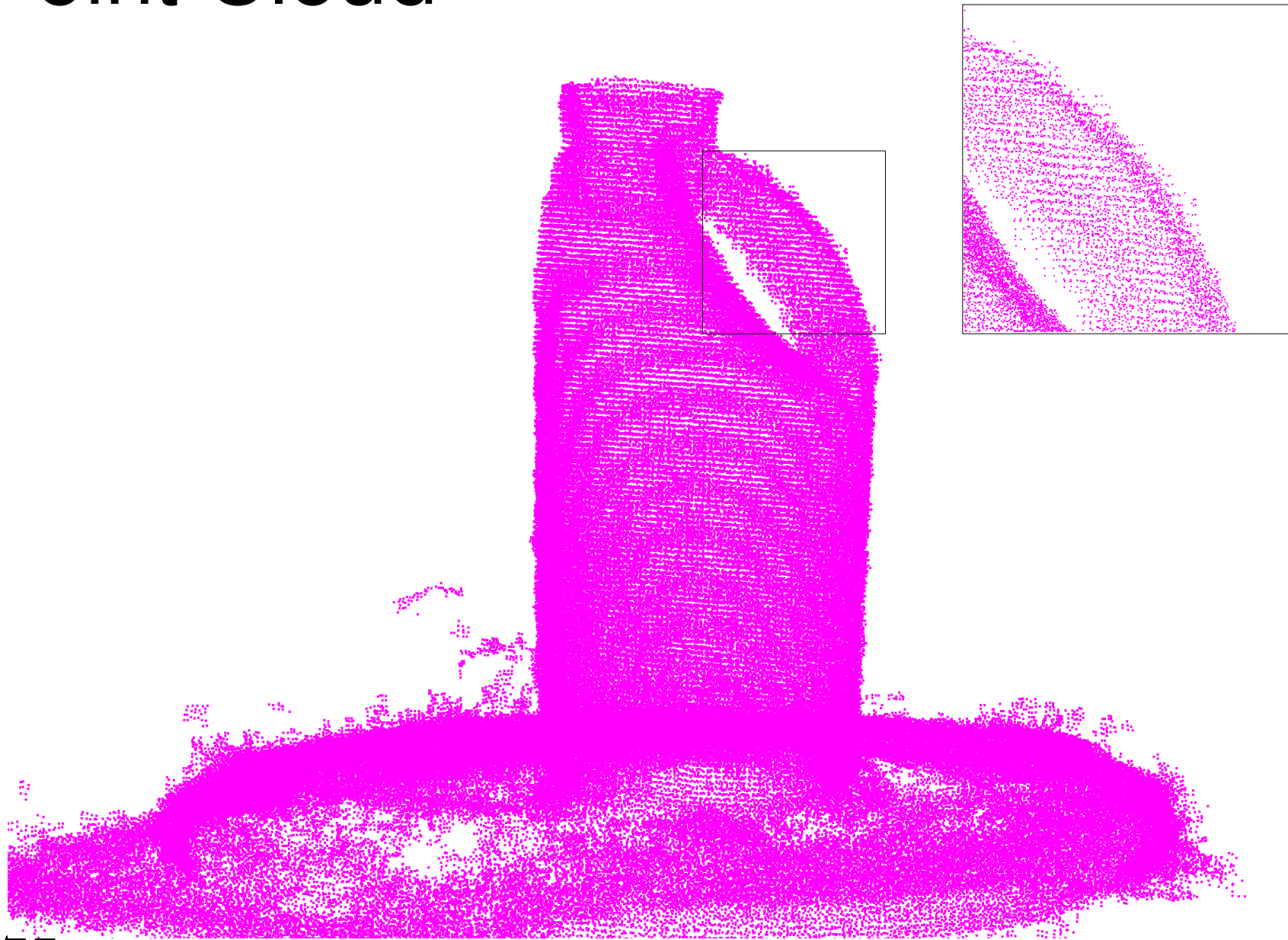

Surface Reconstruction from Point Cloud

Rosie Li
Washington University in St. Louis

Point Cloud



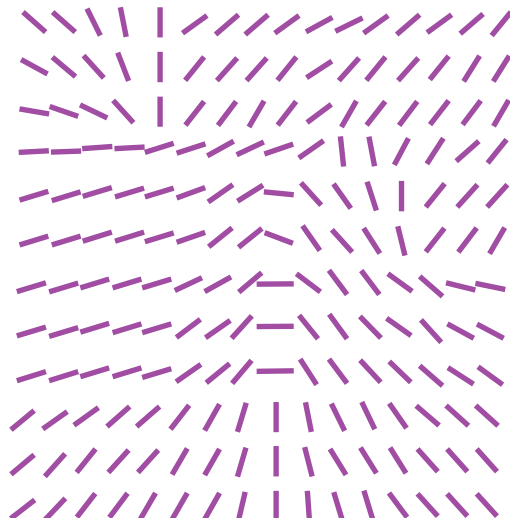
Point Cloud



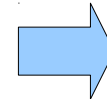
Algorithm Overview



Scalar function:
 $s(x)$



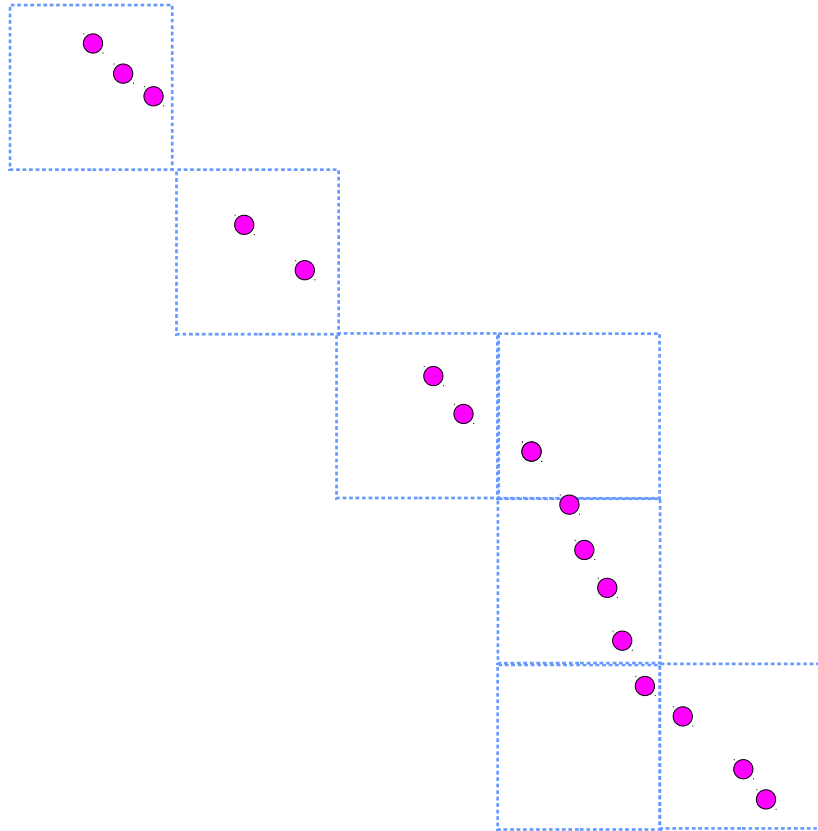
Unoriented vector function:
 $n(x)$



Result

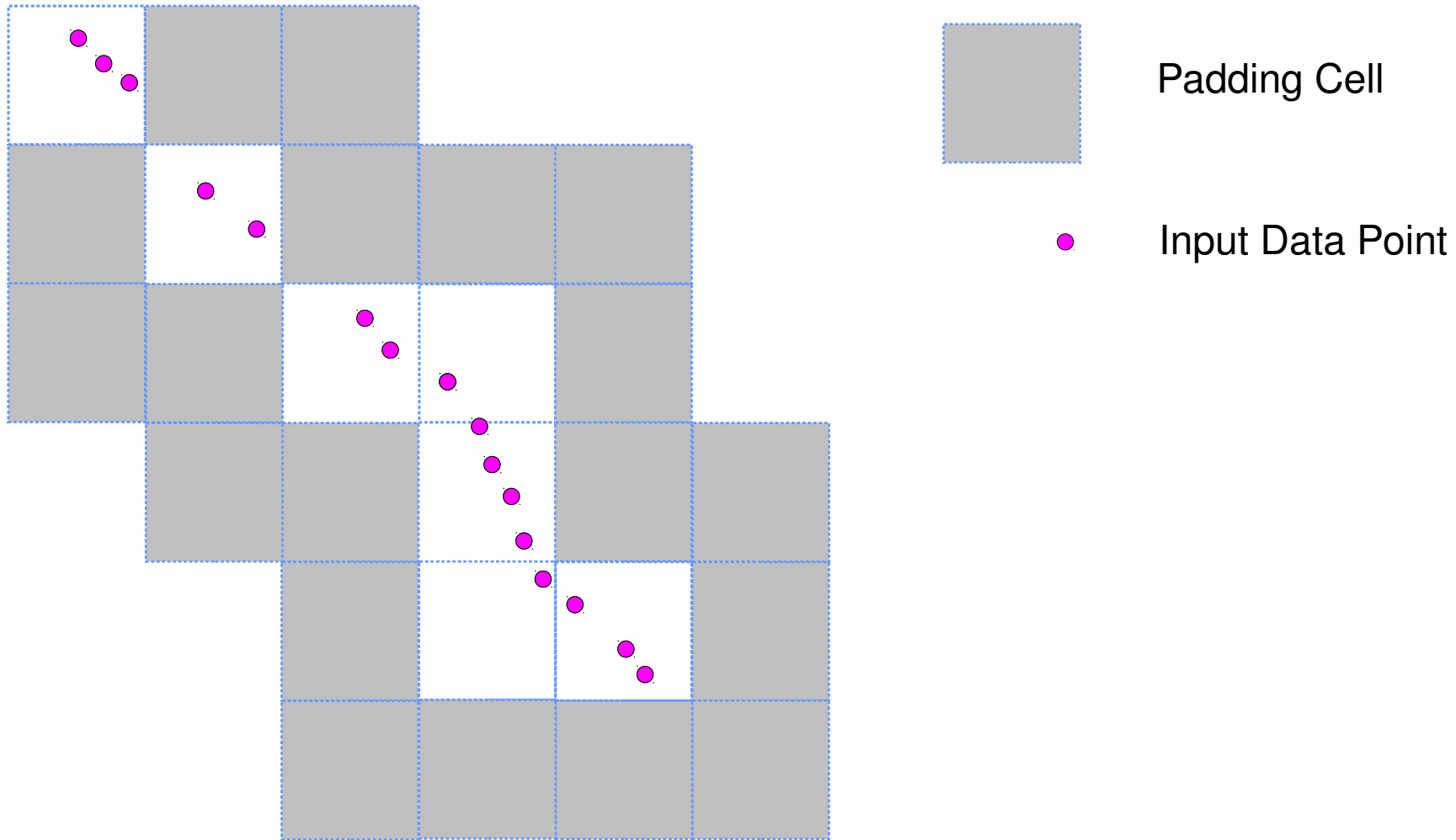
Input

Surface Reconstruction

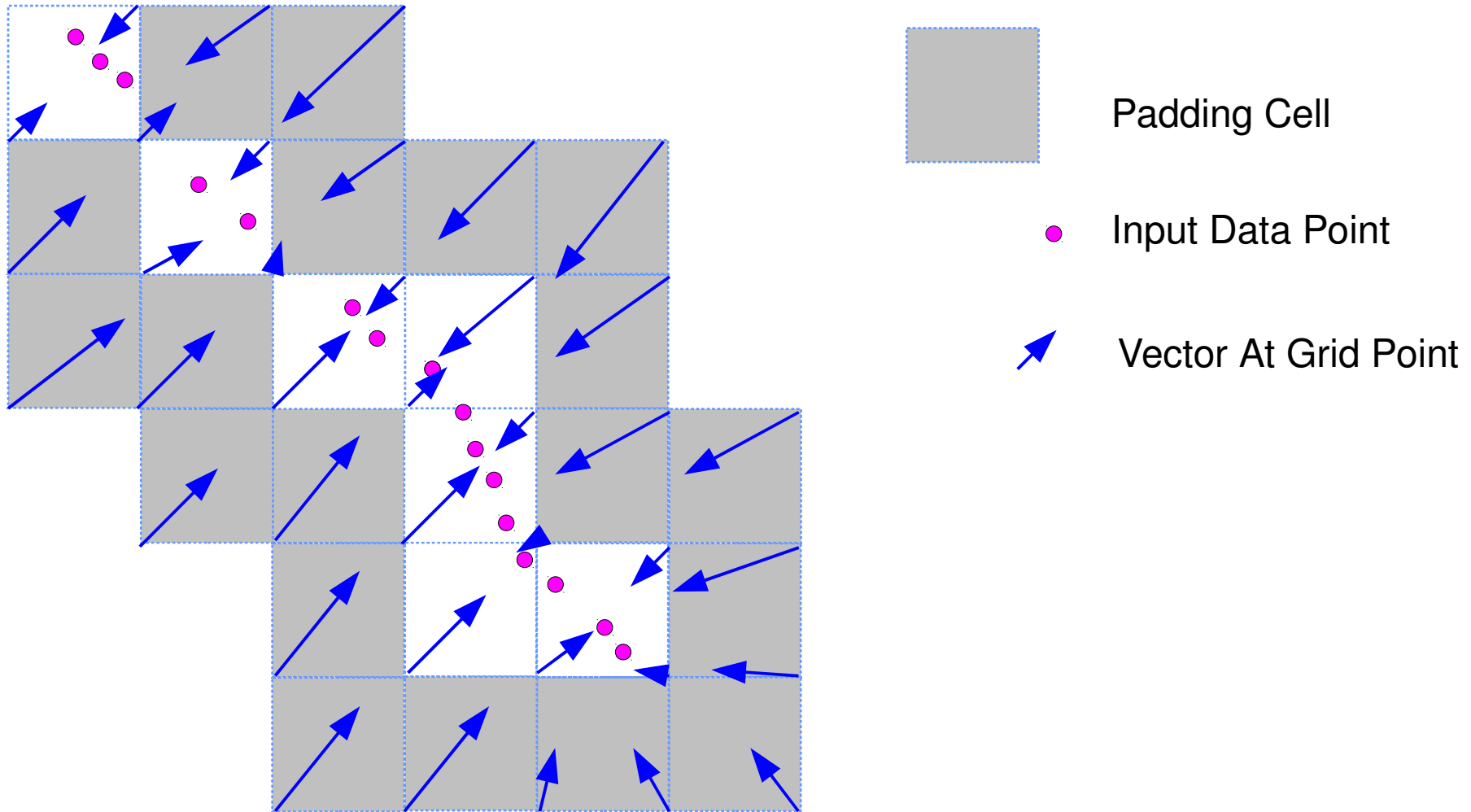


● Input Data Point

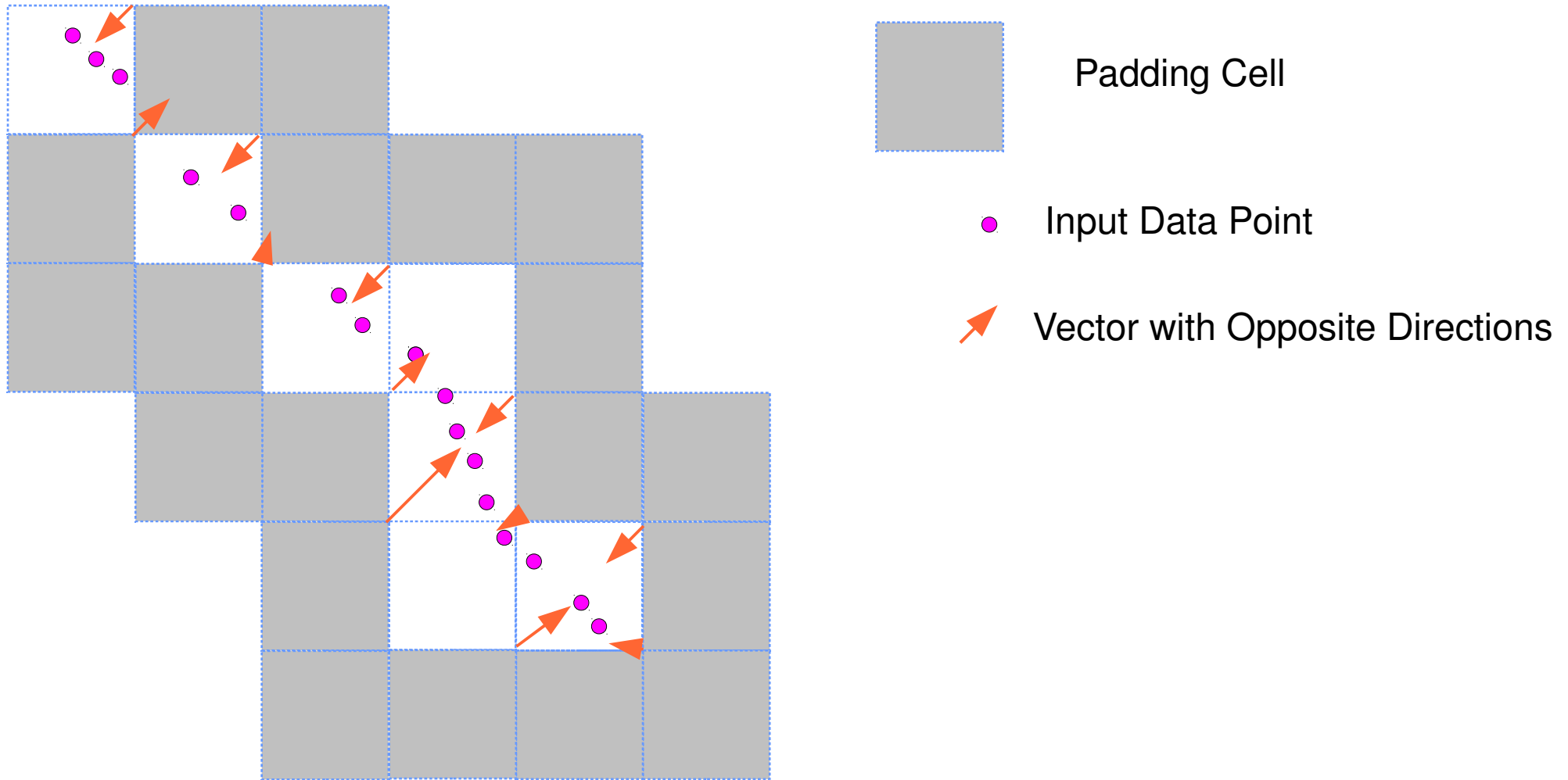
Surface Reconstruction



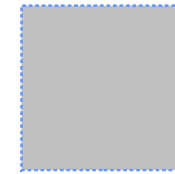
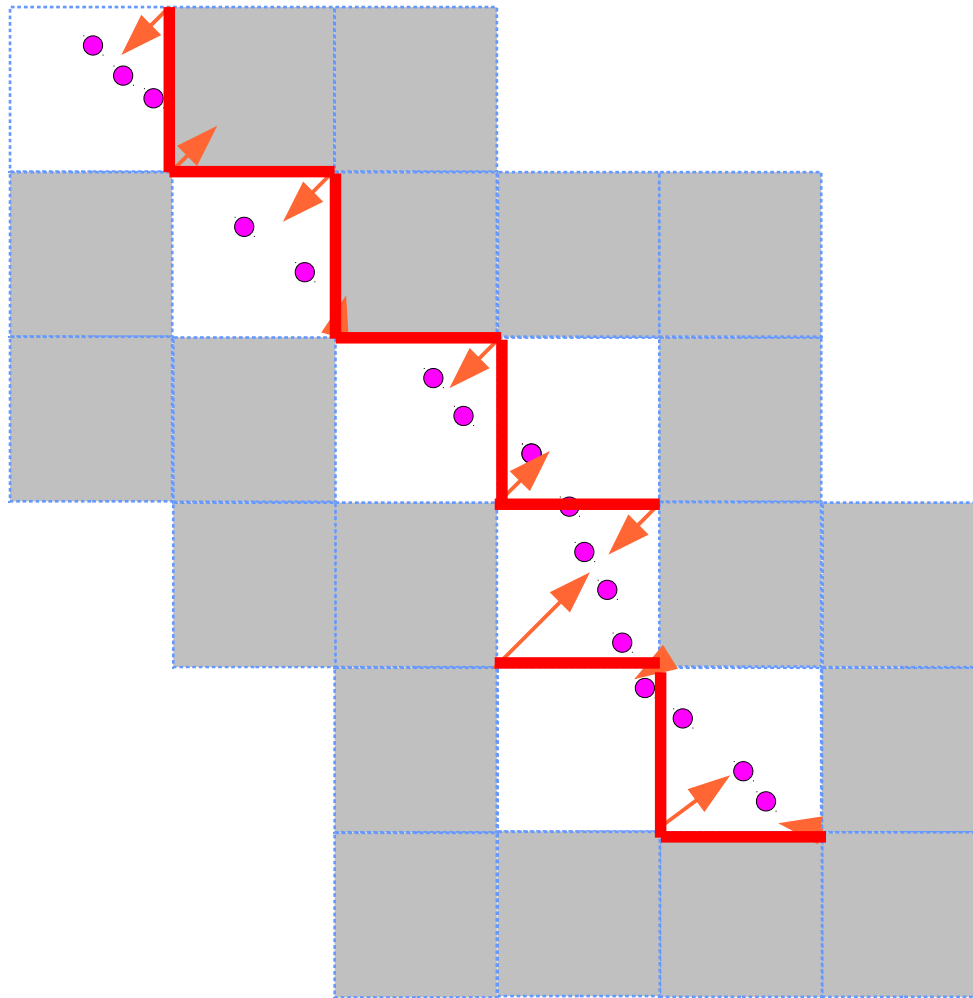
Surface Reconstruction



Surface Reconstruction



Surface Reconstruction



Padding Cell



Input Data Point

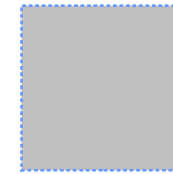
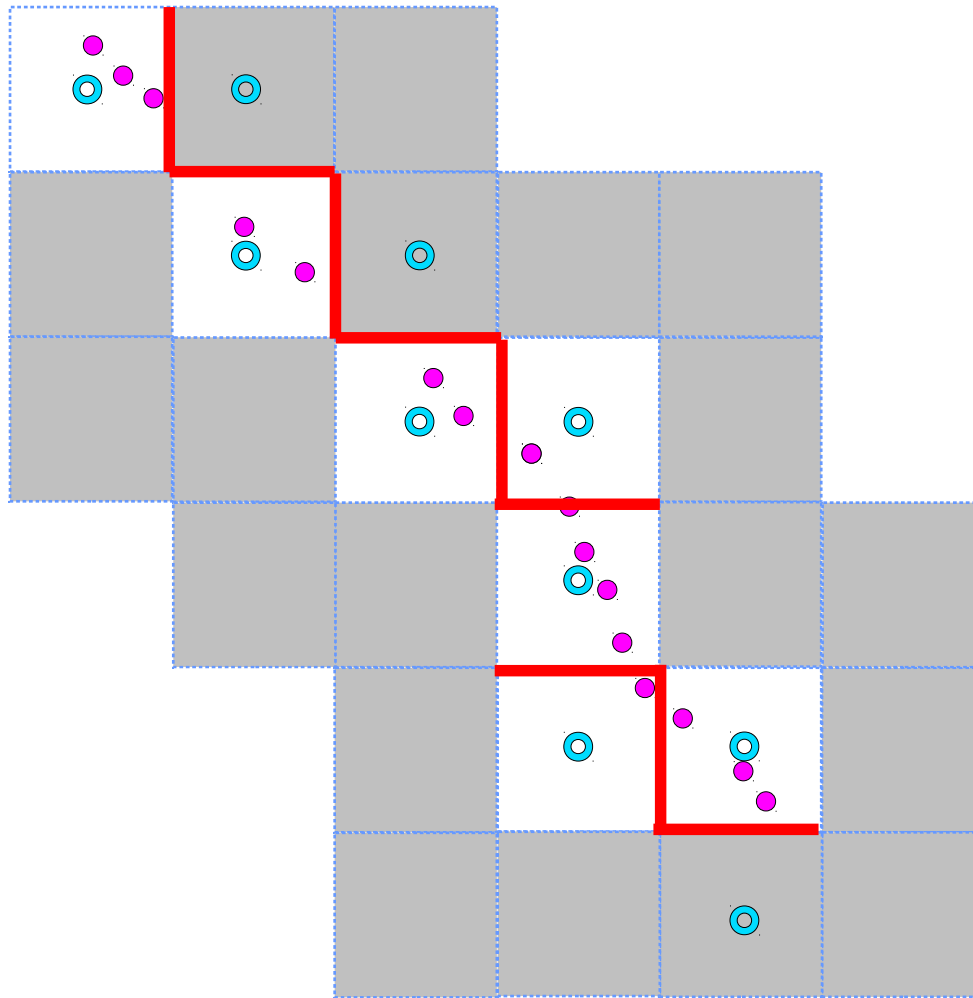


Vector with Opposite Directions



Edge that Intersected by the Surface

Surface Reconstruction



Padding Cell



Input Data Point



Vector with Opposite Directions

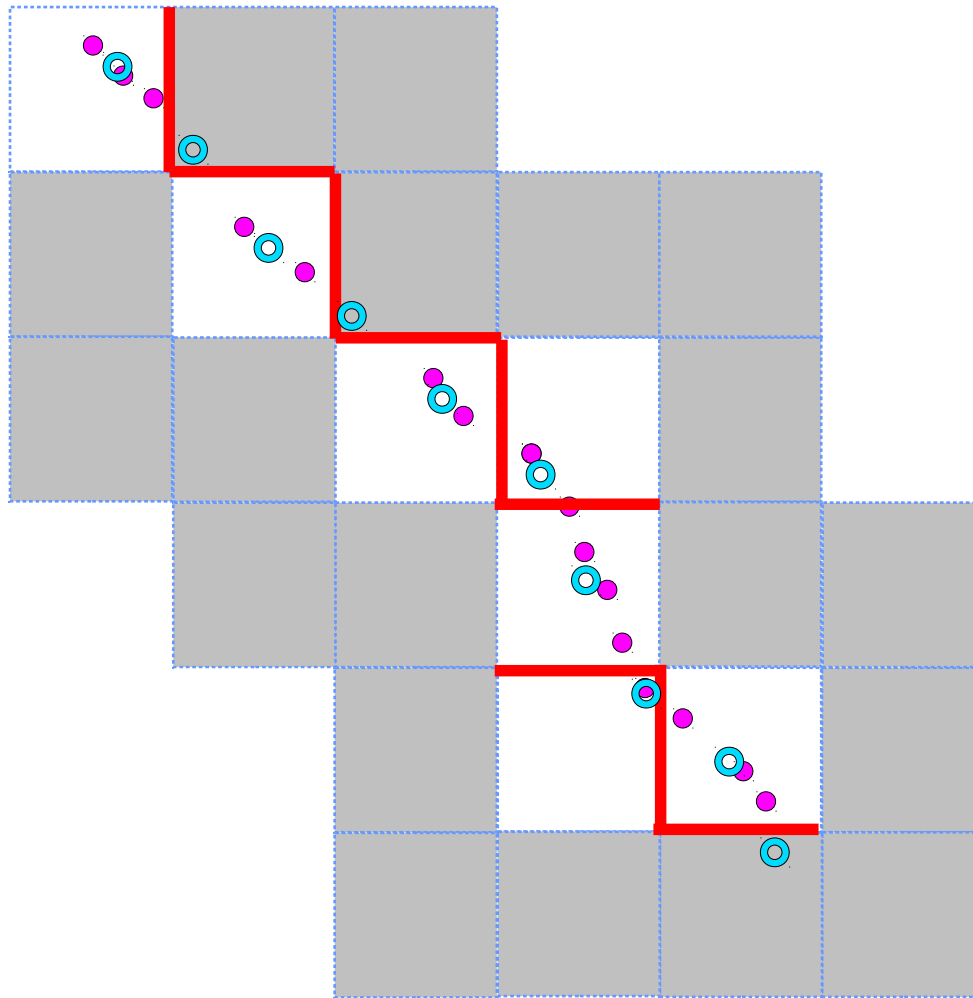


Edge that is Intersected by the Surface



Center of Cell that Contains the Intersected Edge(s)

Surface Reconstruction



Padding Cell



Input Data Point



Vector with Opposite Directions

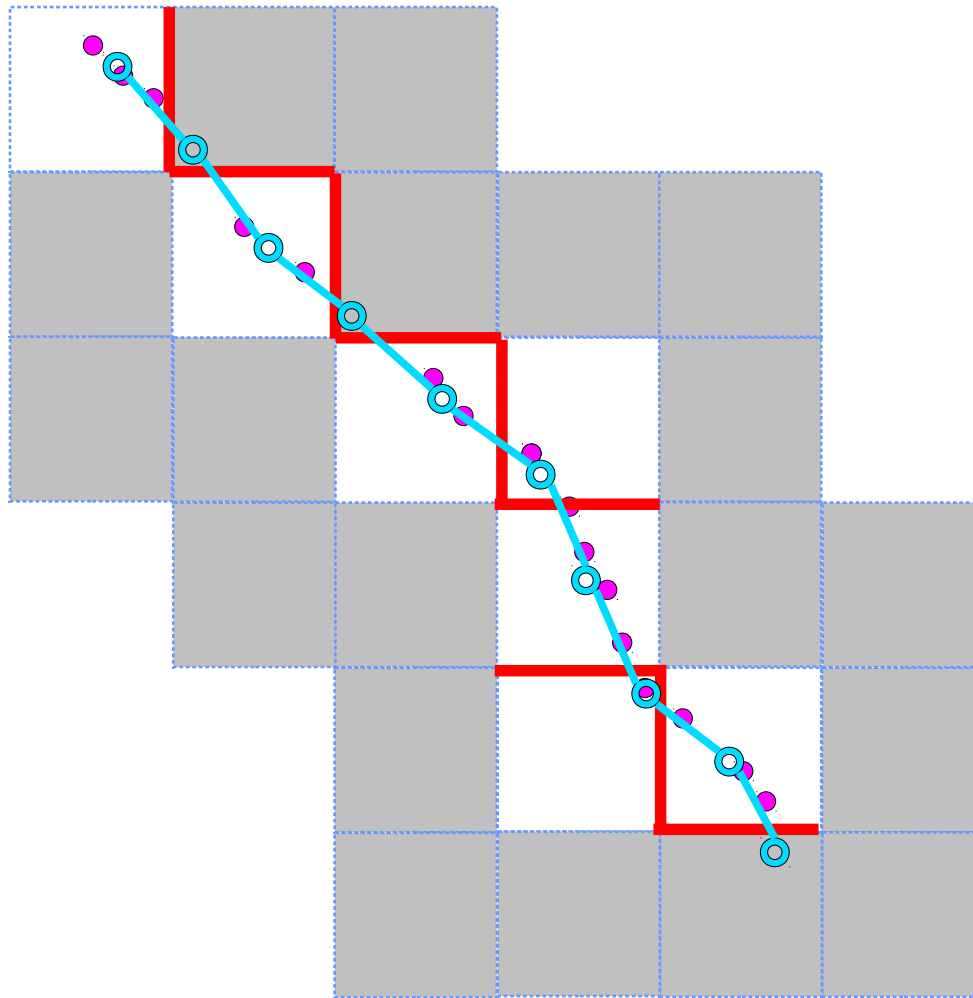


Edge that is Intersected by the Surface



Center of Cell that Contains the Intersected Edge(s) after Projection

Surface Reconstruction



Padding Cell



Input Data Point



Vector with Opposite Directions

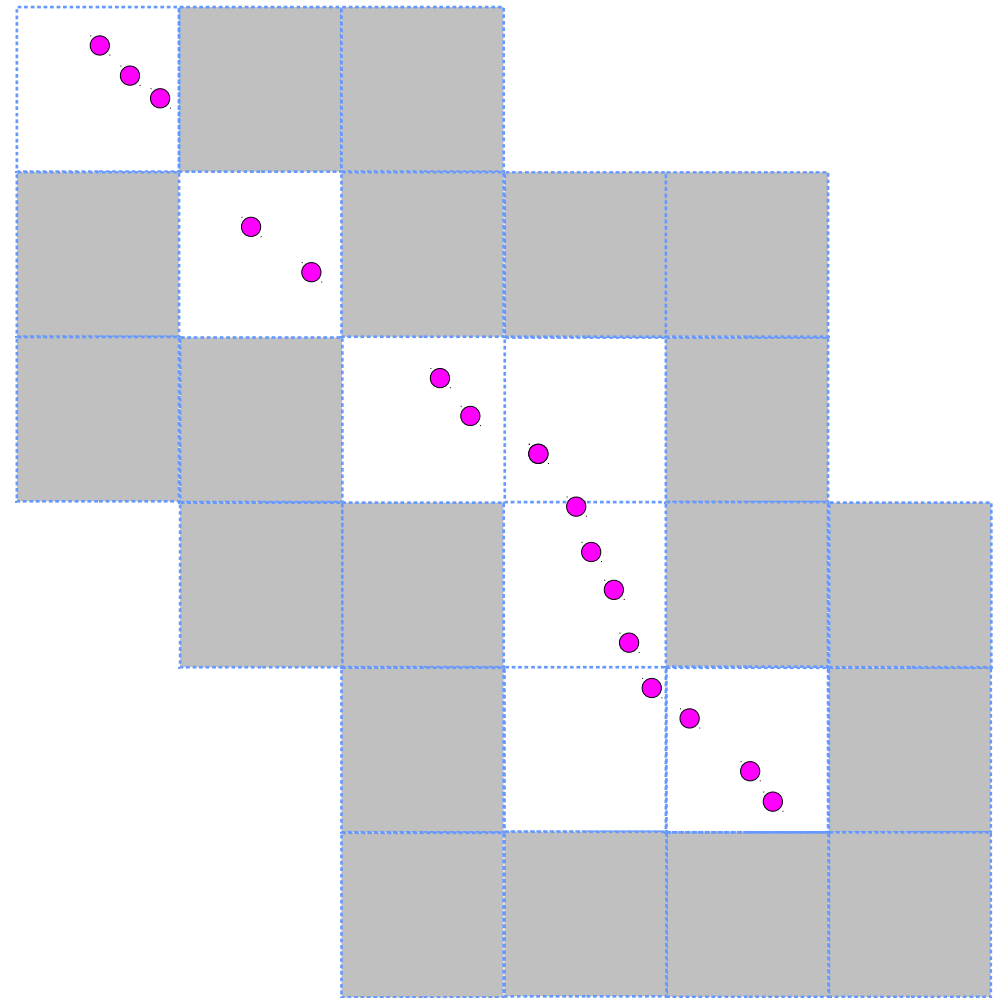
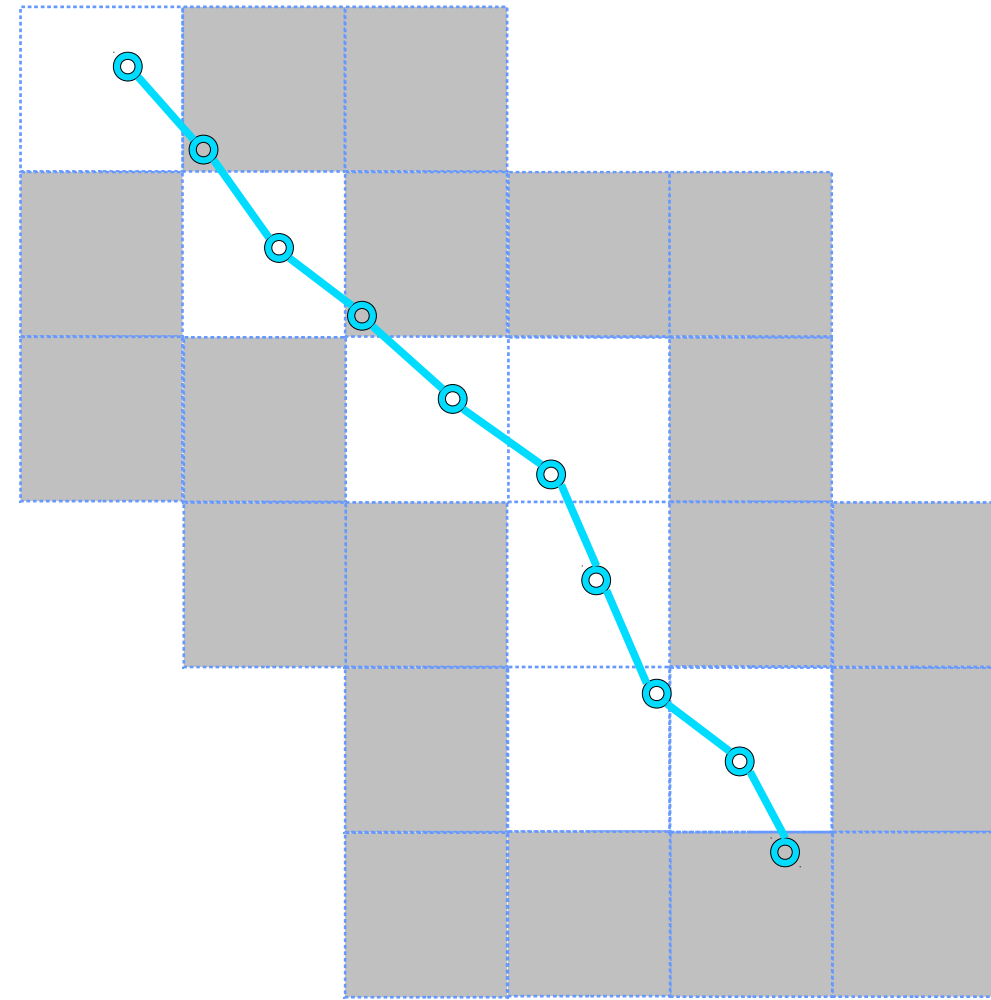


Edge that is Intersected by the Surface



Center of Cell that Contains the Intersected Edge(s) after Projection

Surface Reconstruction



Result



Result



Conclusion

- Contribution
 - Create smooth surface
 - Fill small holes by selecting appropriate padding size
 - Fast access of cell information through the hash table
- Future Work
 - Adaptive padding size
 - Parallel computing