INFO-F420
- Computational Geometry -
Convex decomposition of simple polygons

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1 Proposal

For our project, we will construct an application demonstrating several algorithms for decomposing a simple polygon. This application will demonstrate the triangulation algorithm seen in class and the algorithm from Chazelle [Chazelle and Dobkin, 1979]. Both algorithm will be compared in their effectiveness for the construction of Minkowski sums [Agarwal et al., 2002].

For this project we would like to implement it in *Processing*[1] as it will make it easier to work with without having to worry about the *JavaScript* engine being slow. Doing the project in Java allows us also to get up and running more quickly as our knowledge is better in this language.

We chose `Processing` to still be close to the exercises seen in class, and provide a visual representation of the discussed problem.

References

Agarwal, P. K., Flato, E., & Halperin, D. (2002). Polygon decomposition for efficient construction of Minkowski sums. *Computational Geometry, 21*(1-2), 39–61. https://doi.org/10.1016/S0925-7721(01)00041-4

Chazelle, B., & Dobkin, D. (1979). Decomposing a polygon into its convex parts. *Proceedings of the eleventh annual ACM symposium on Theory of computing - STOC '79*, 38–48. https://doi.org/10.1145/800135.804396

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[1]https://processing.org/