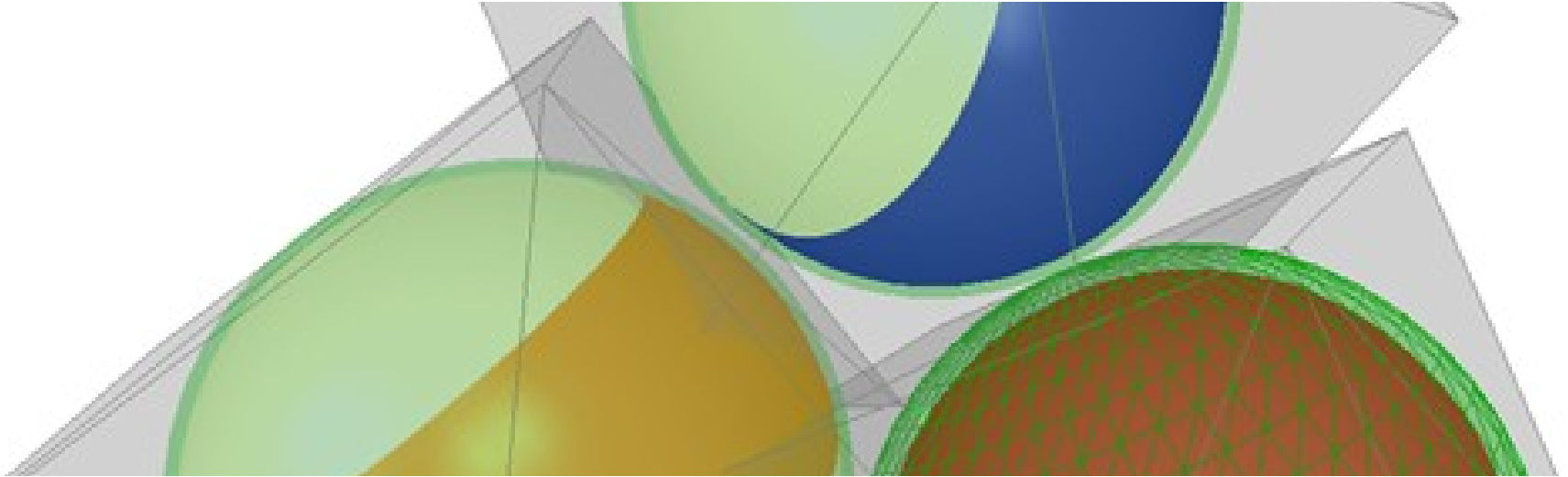




Clemens Kmentt

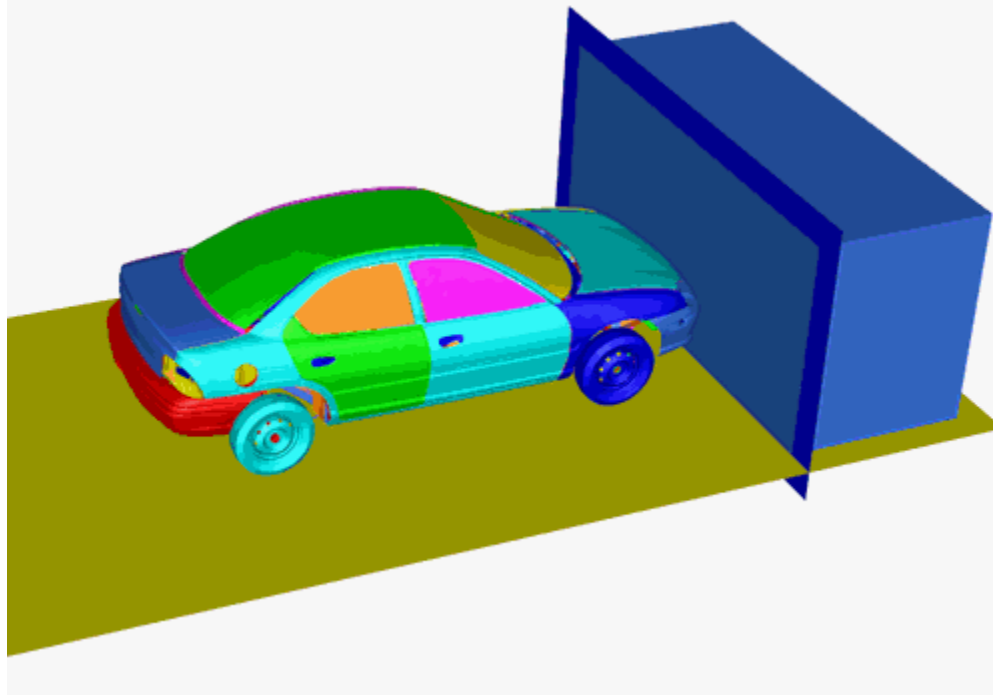
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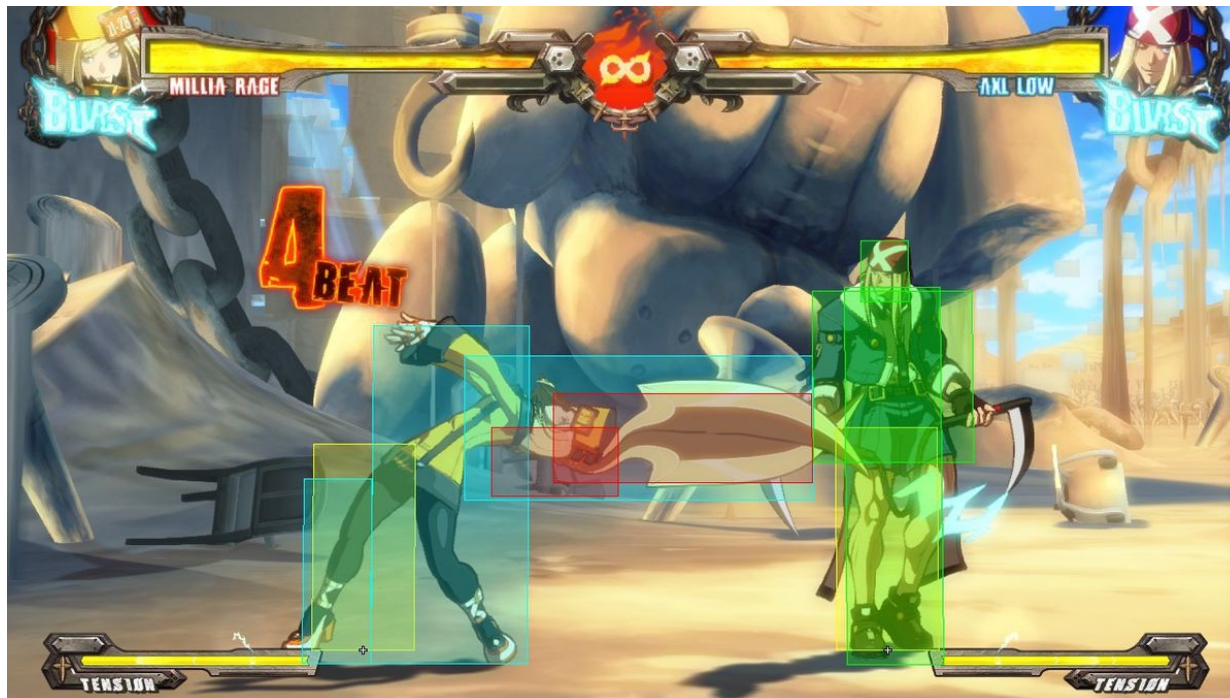
# Collision Detection Algorithms



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# Warum brauchen wir Collision Detection?

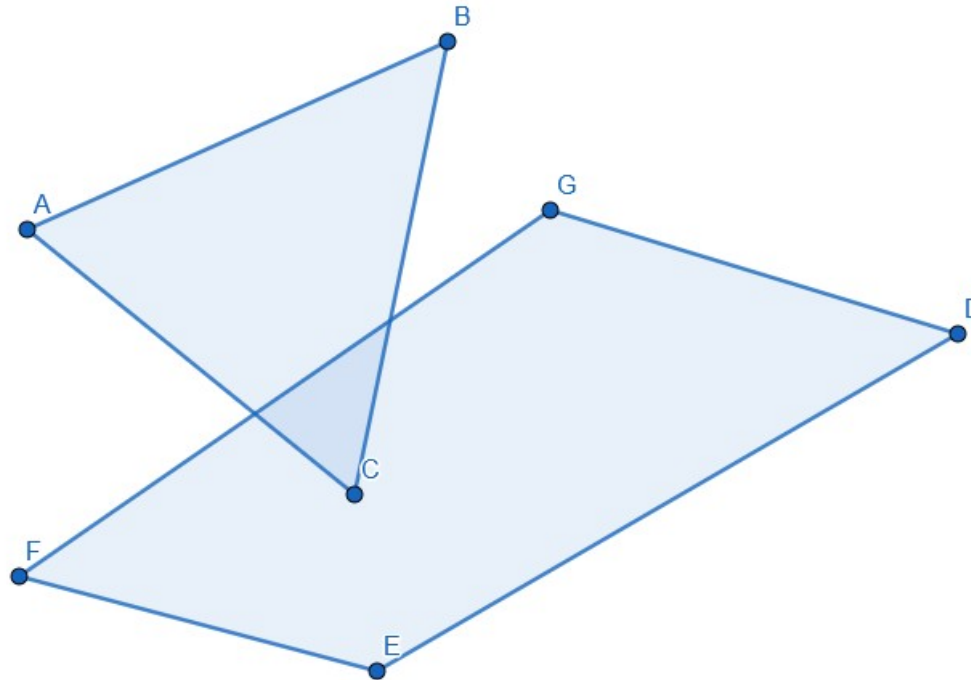


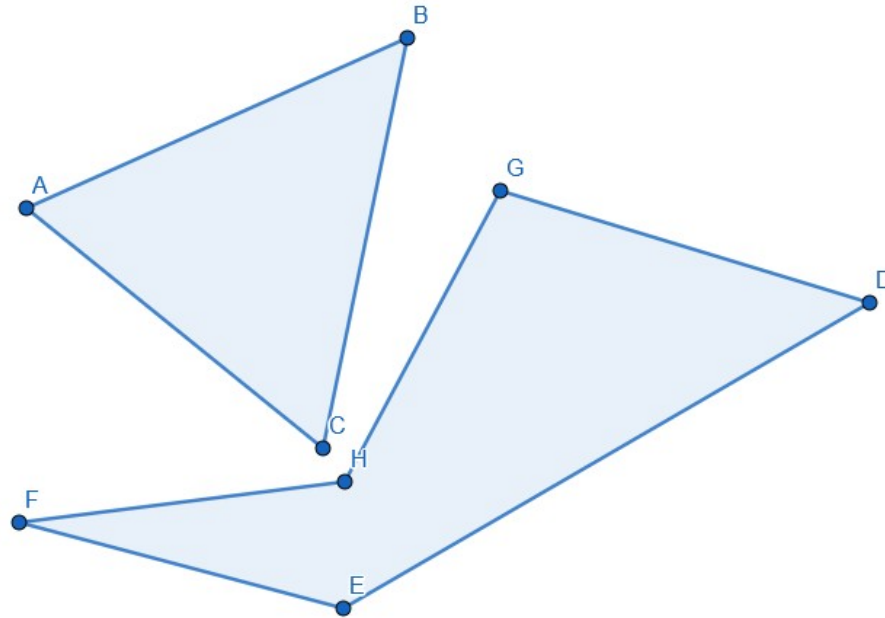




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# Wie entdeckt man Kollisionen?



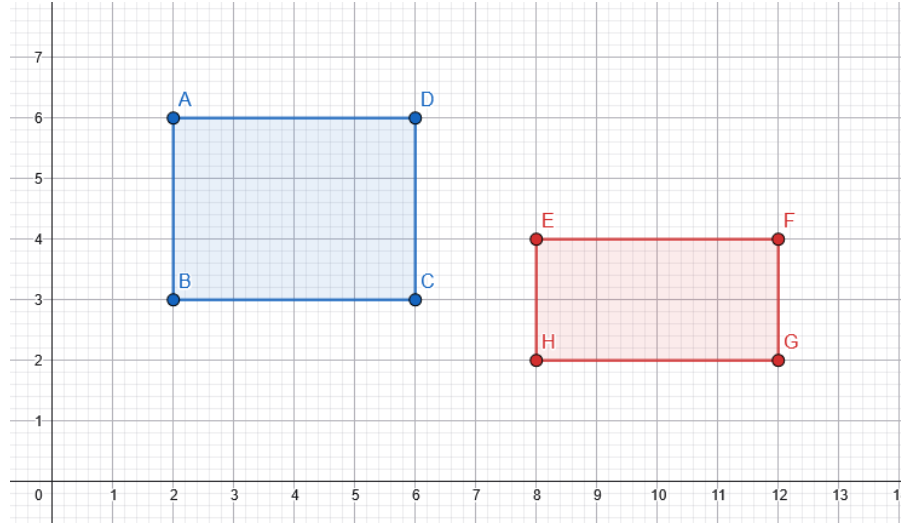


# Broad-Phase Collision Detection

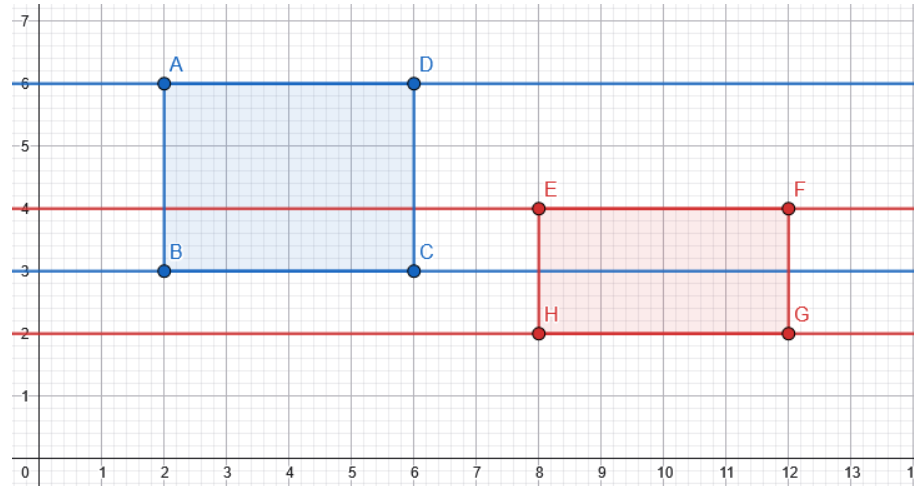
- AABB (Axis-Aligned Bounding Boxes)
- SAT (Separated Axis Theorem)



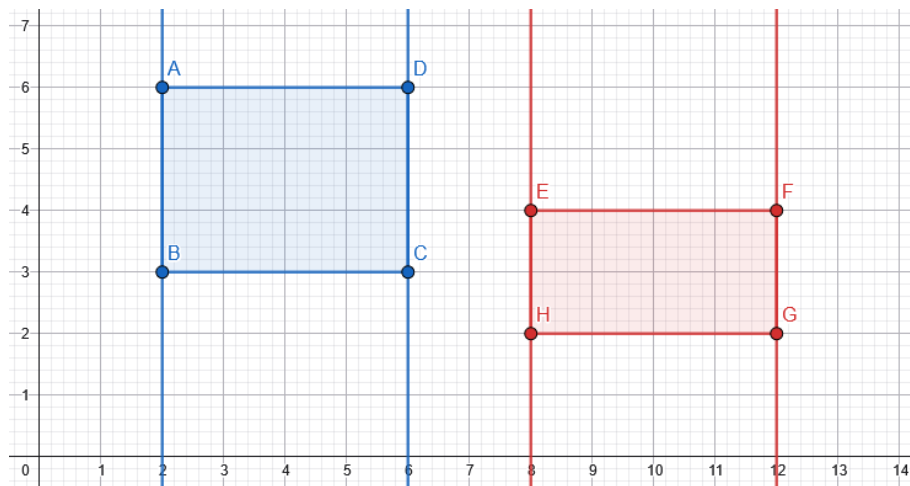
# Axis-Aligned Bounding Boxes

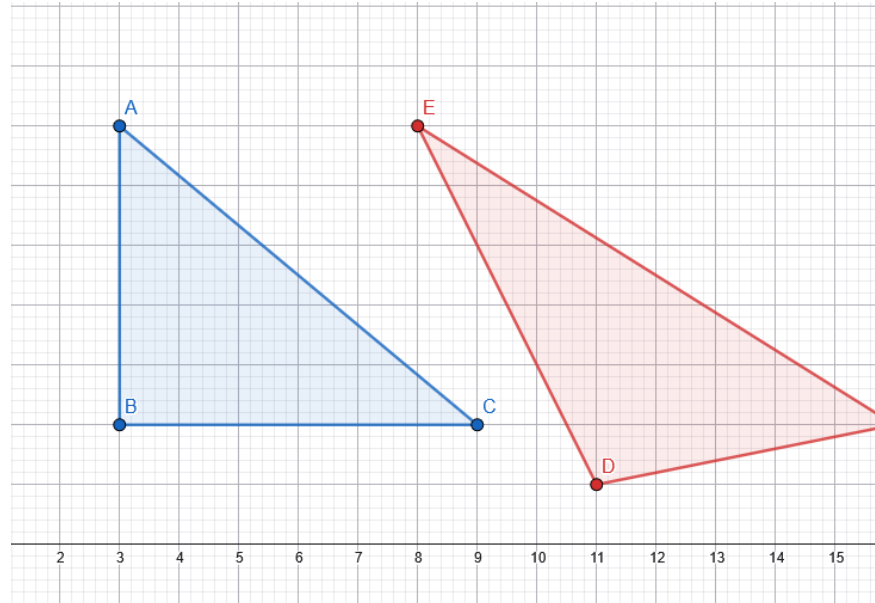


# Axis-Aligned Bounding Boxes

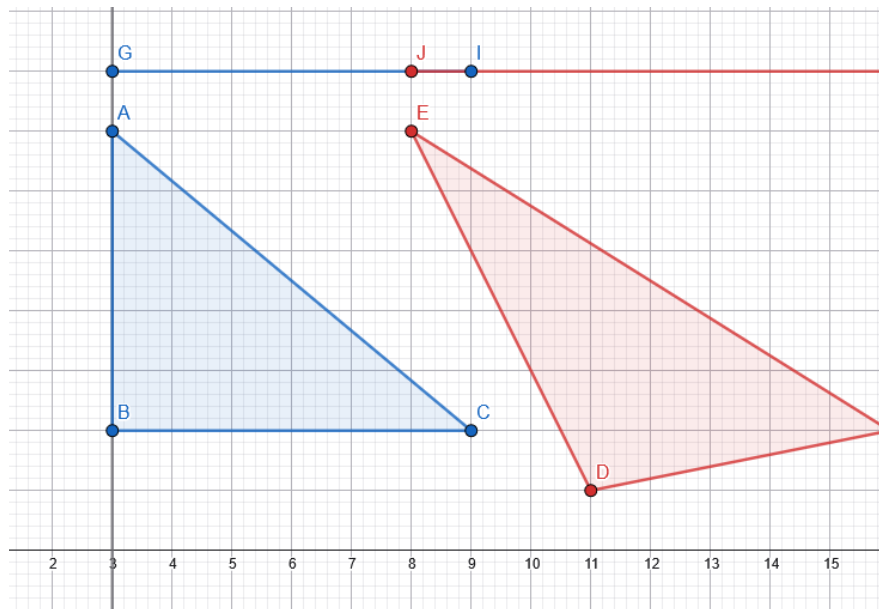


# Axis-Aligned Bounding Boxes

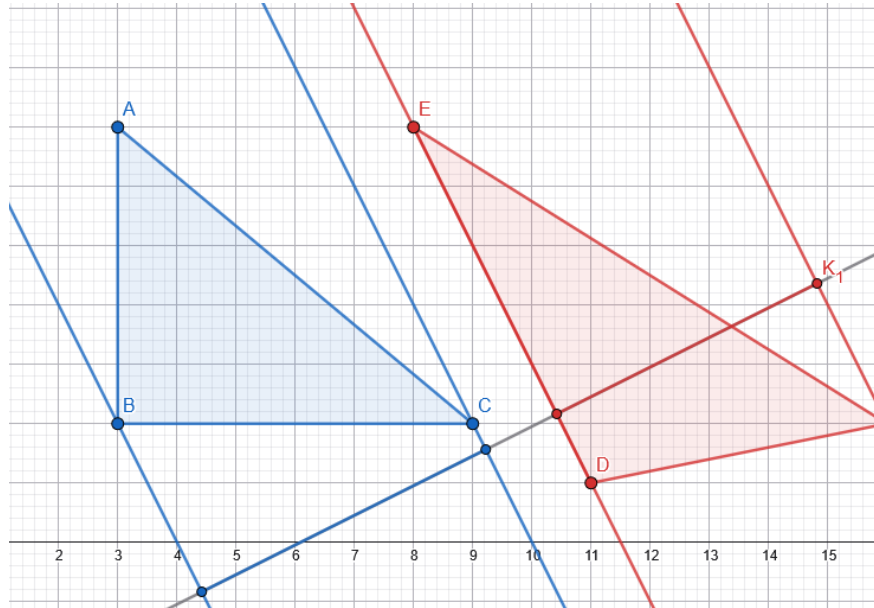




# Separated Axis Theorem



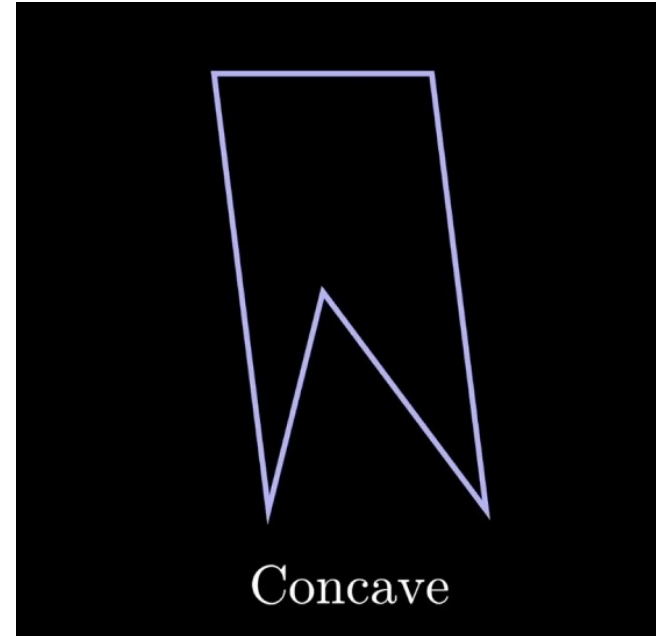
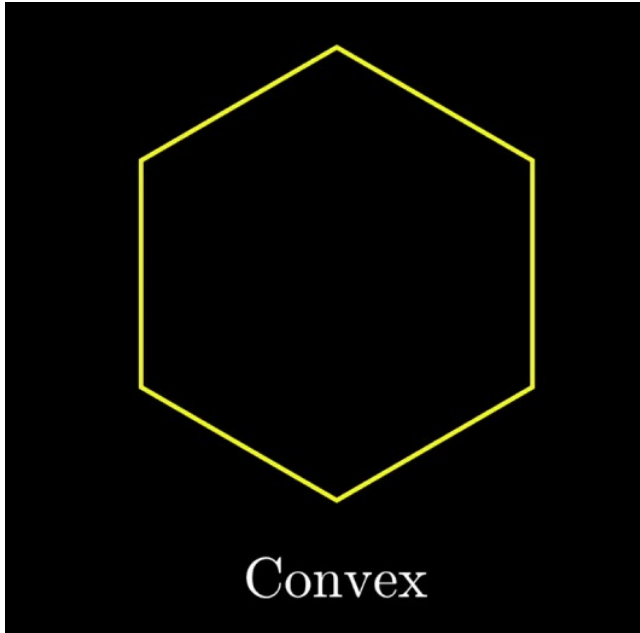
# Separated Axis Theorem



# Narrow-Phase Collision Detection

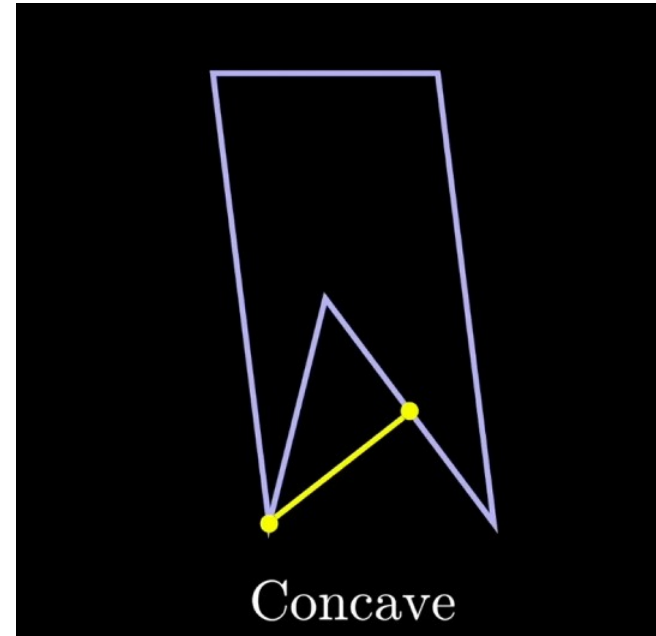
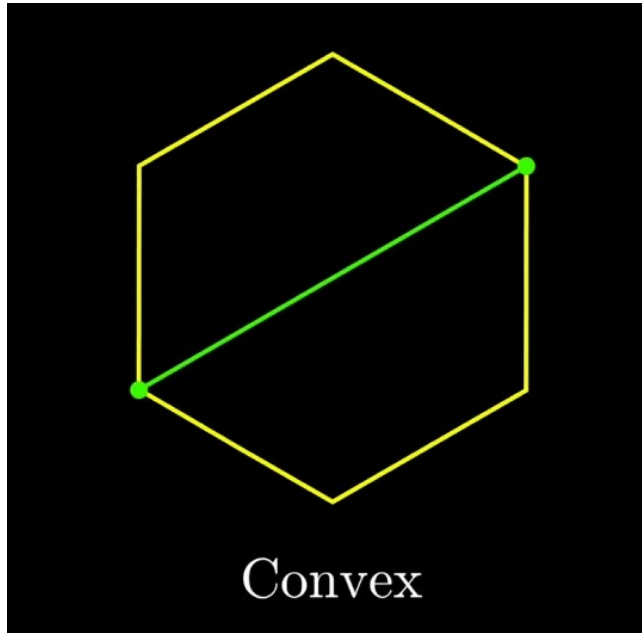
- GJK
- EPA

# Konvex vs Konkav

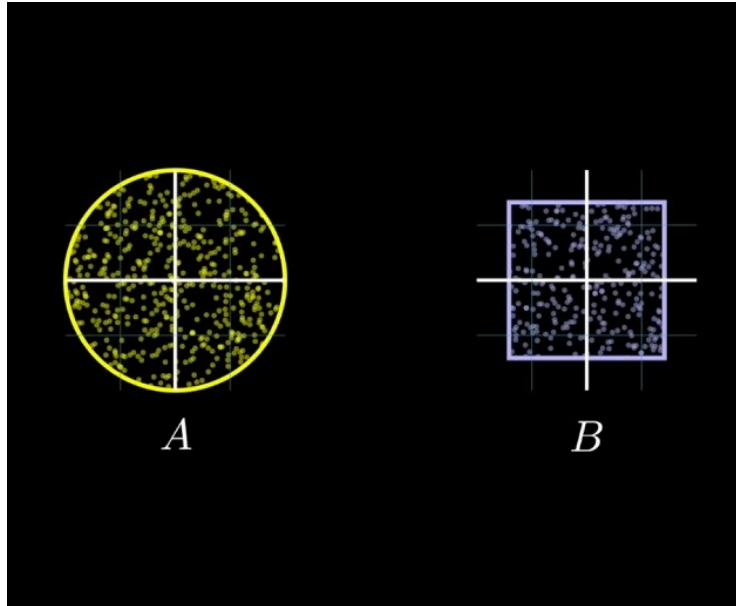




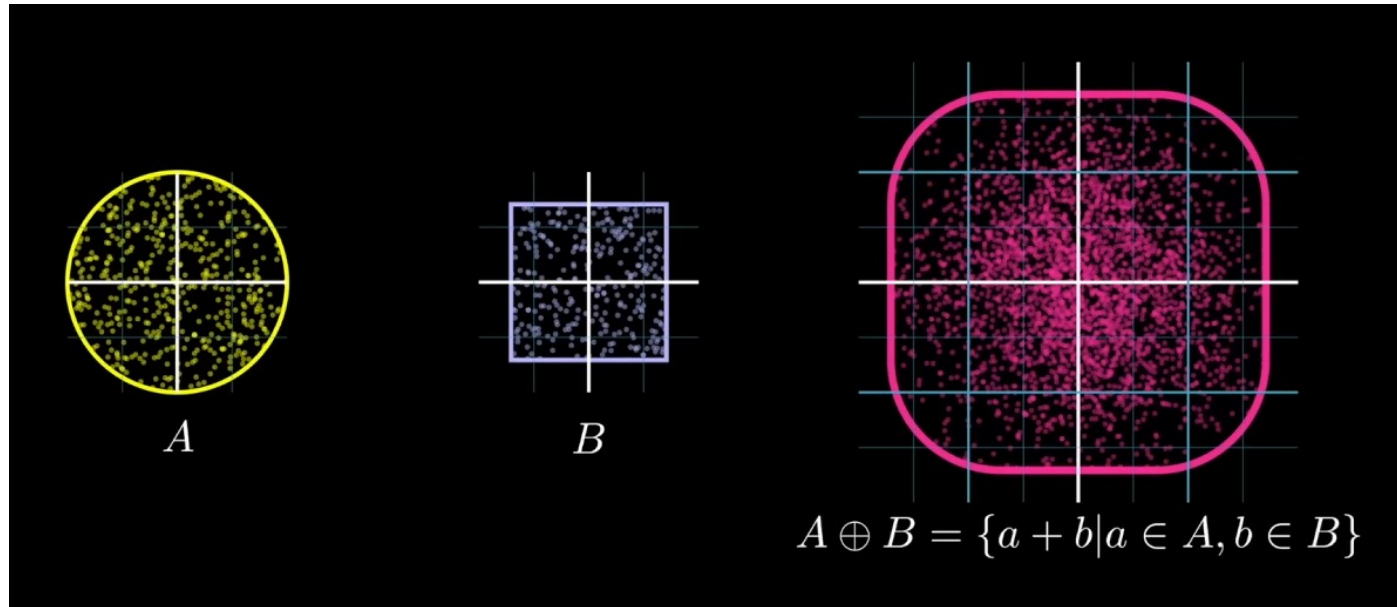
# Konvex vs Konkav



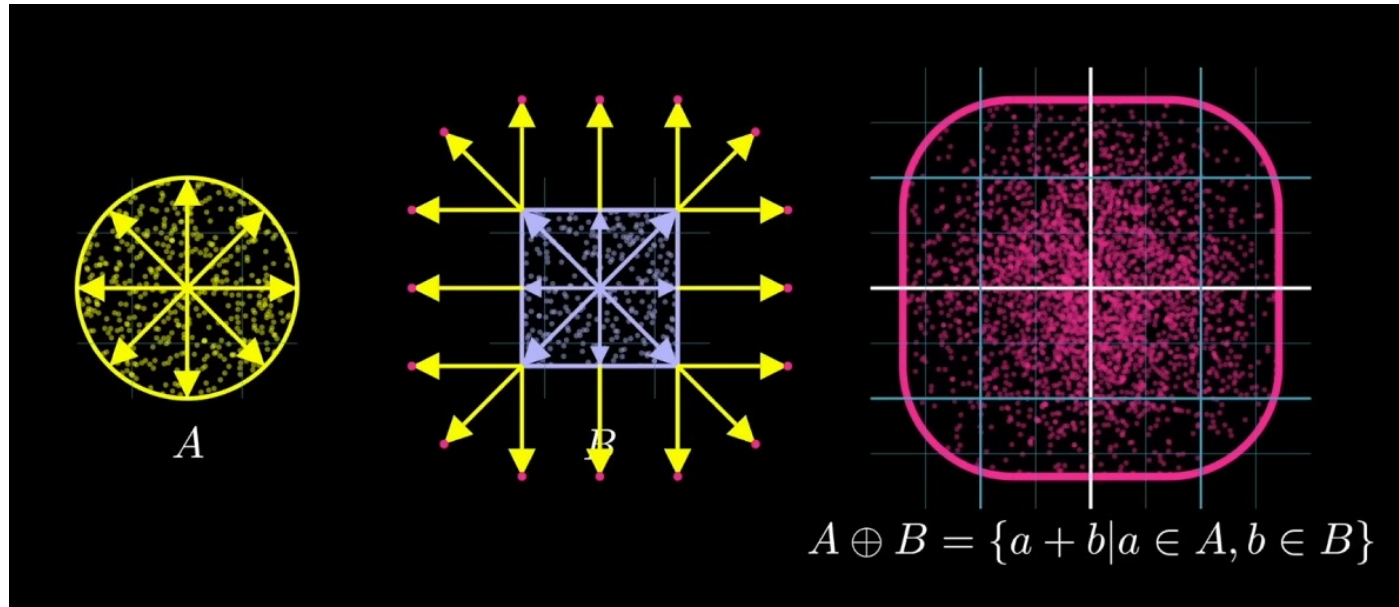
# Minkowski-Summe



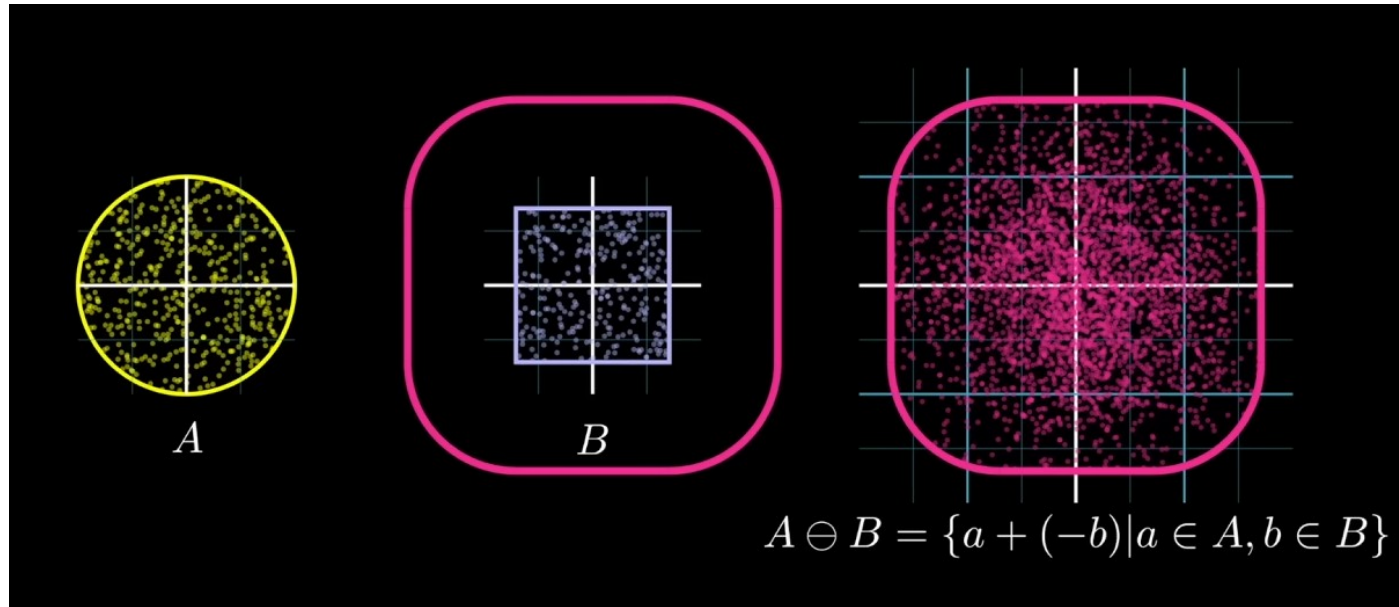
# Minkowski-Summe



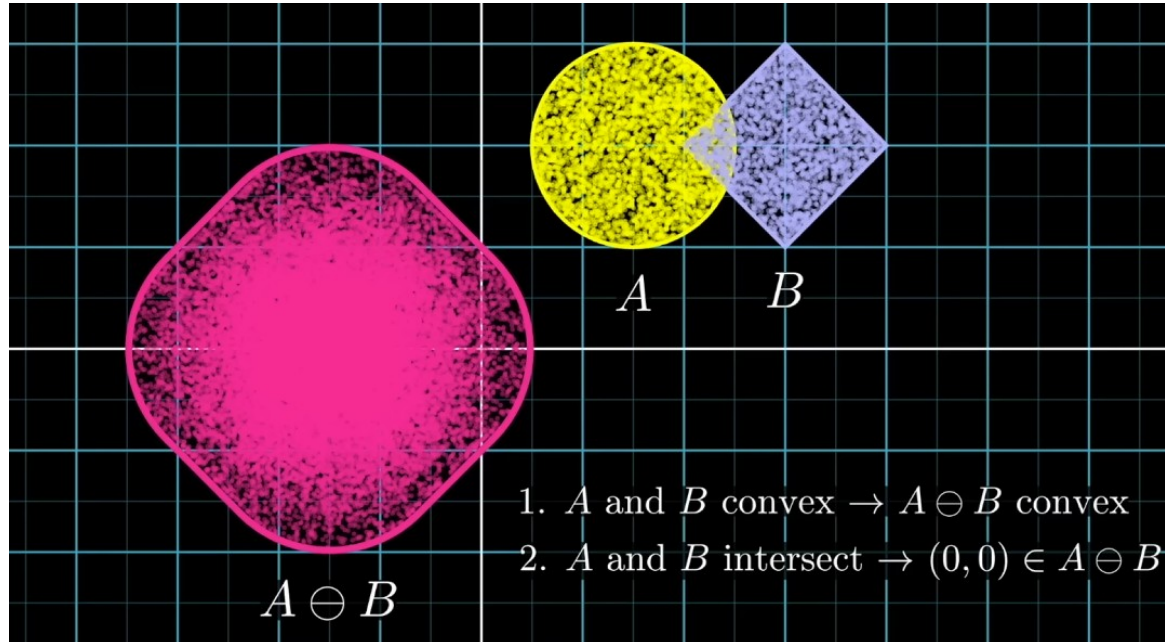
# Minkowski-Summe



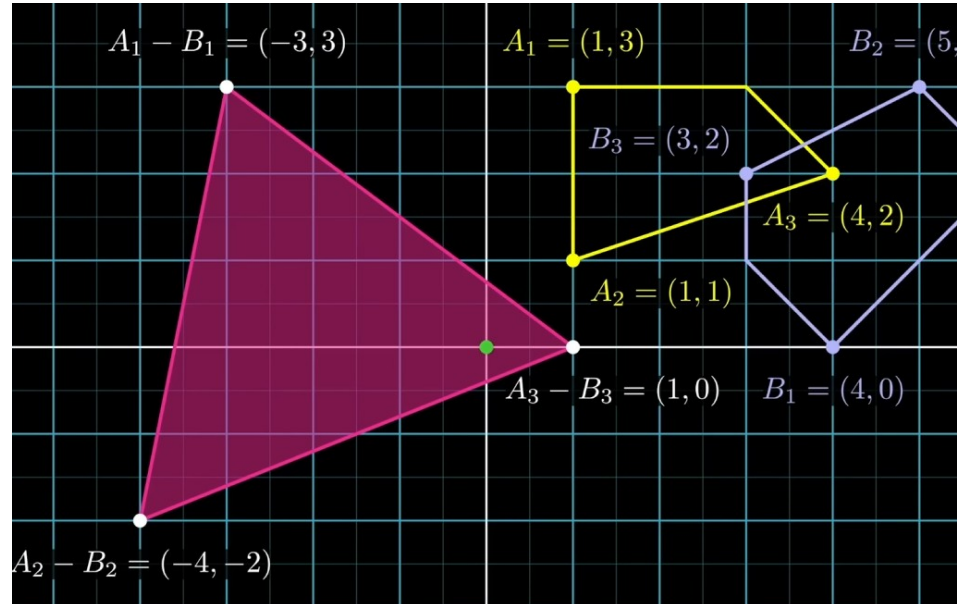
# Minkowski-Differenz



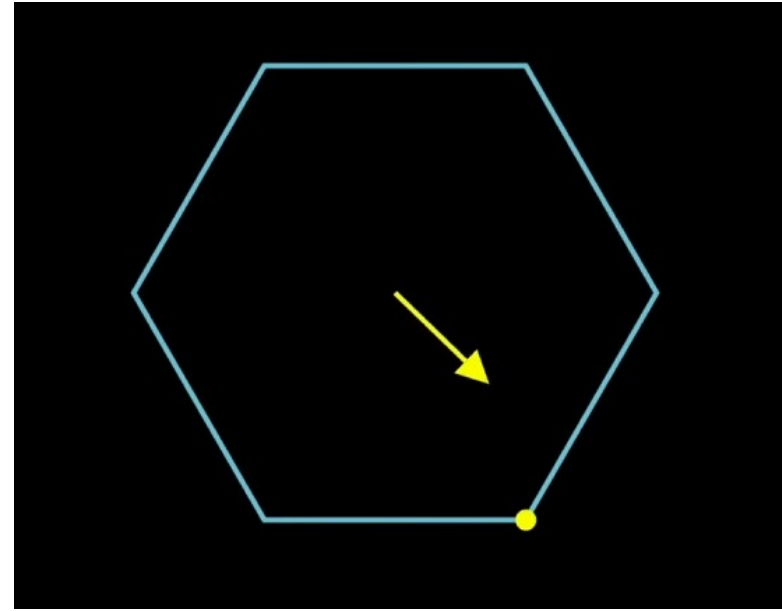
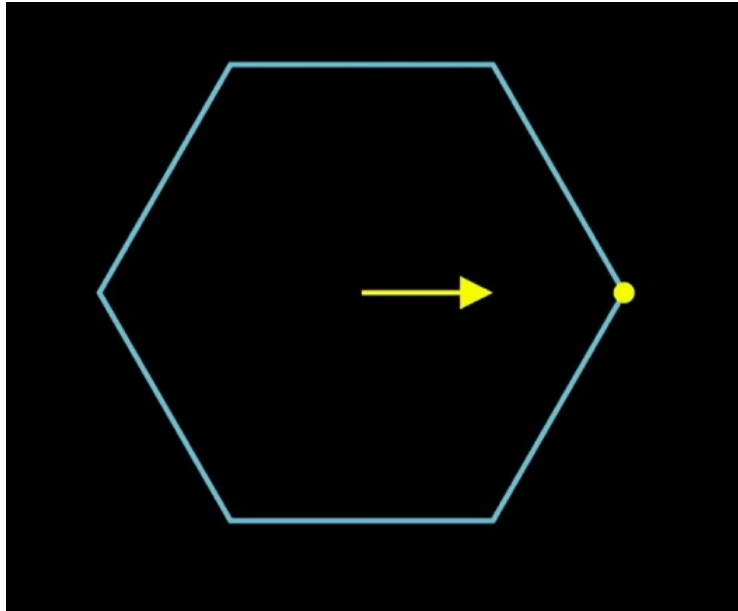
# Minkowski-Differenz



# GJK (Gilbert–Johnson–Keerthi)

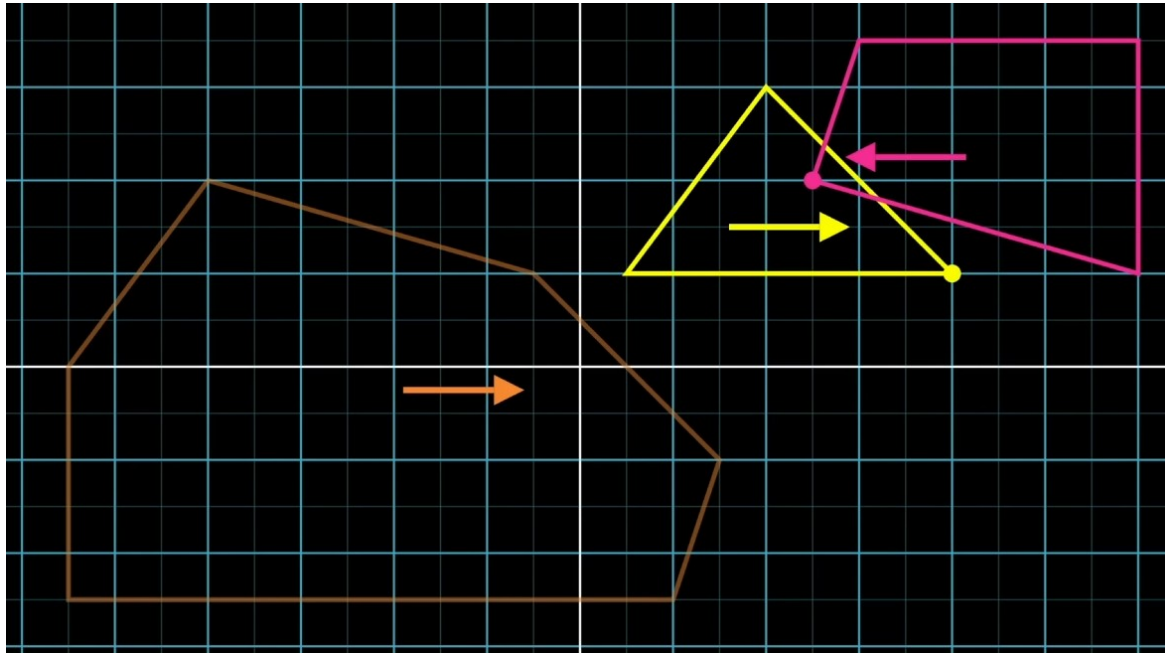


# GJK (Gilbert–Johnson–Keerthi)

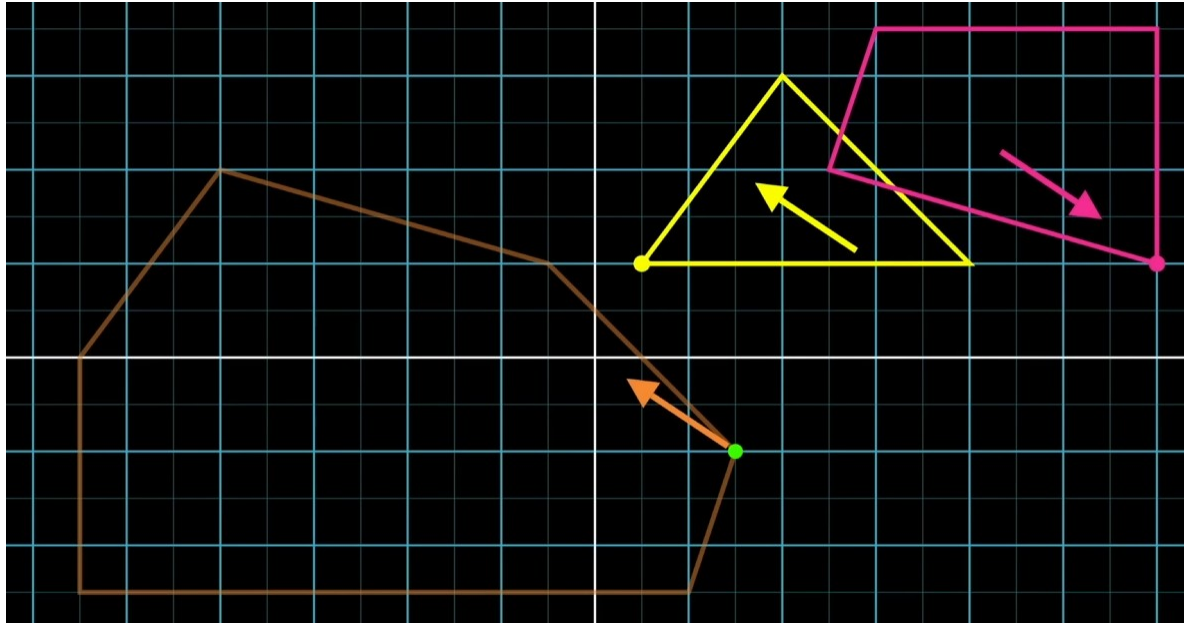




# GJK (Gilbert–Johnson–Keerthi)



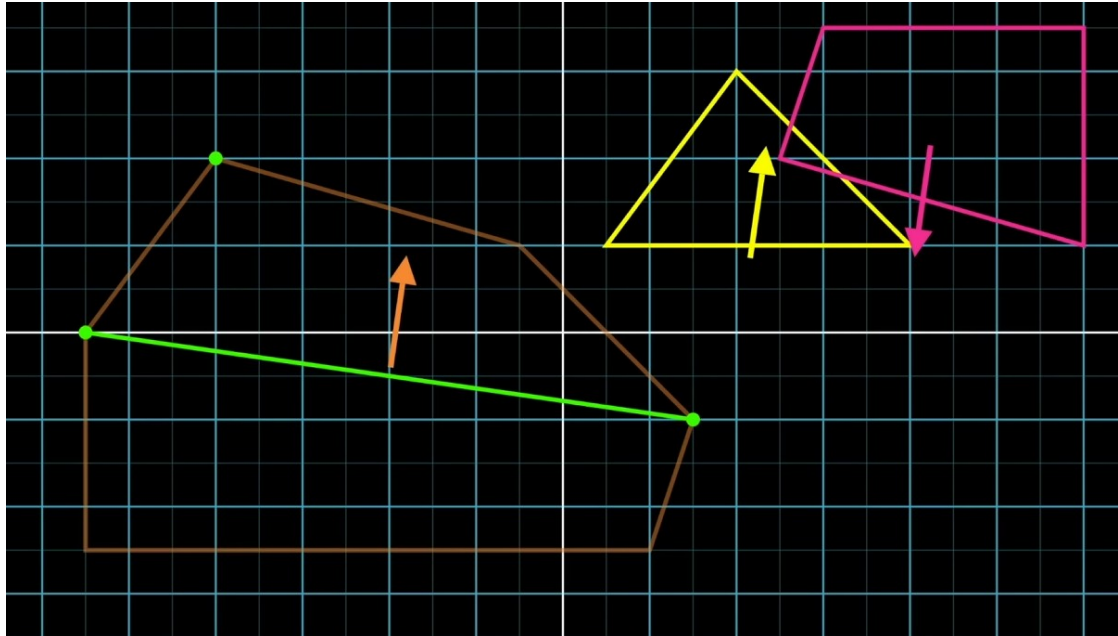
# GJK (Gilbert–Johnson–Keerthi)



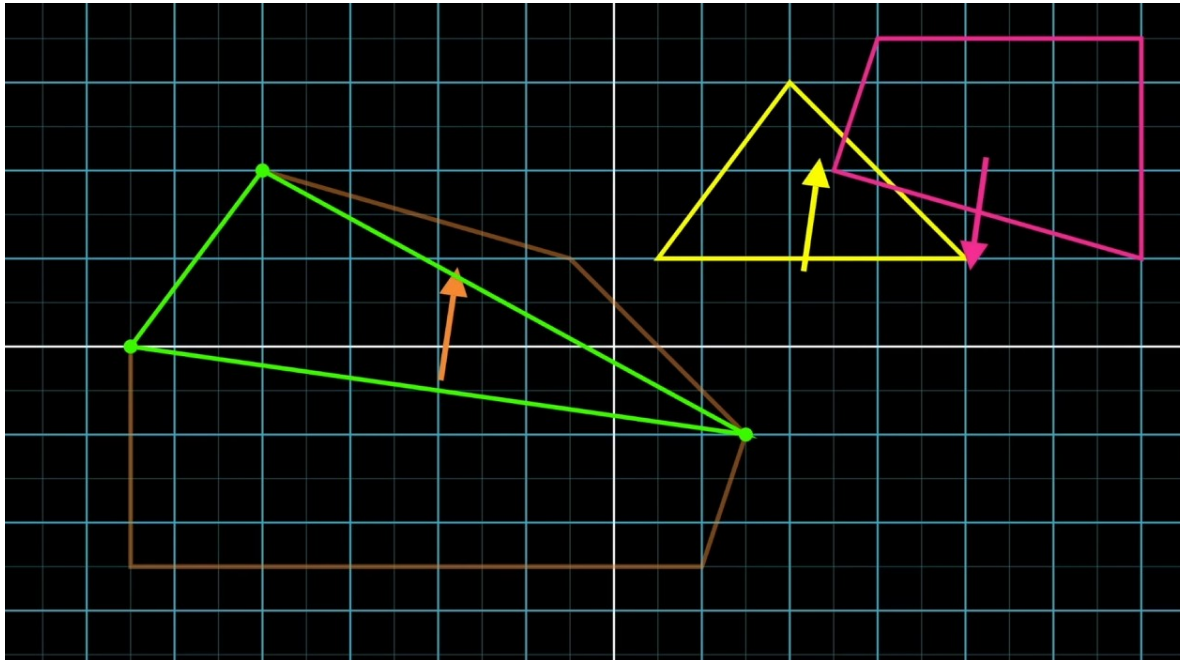
# GJK (Gilbert–Johnson–Keerthi)



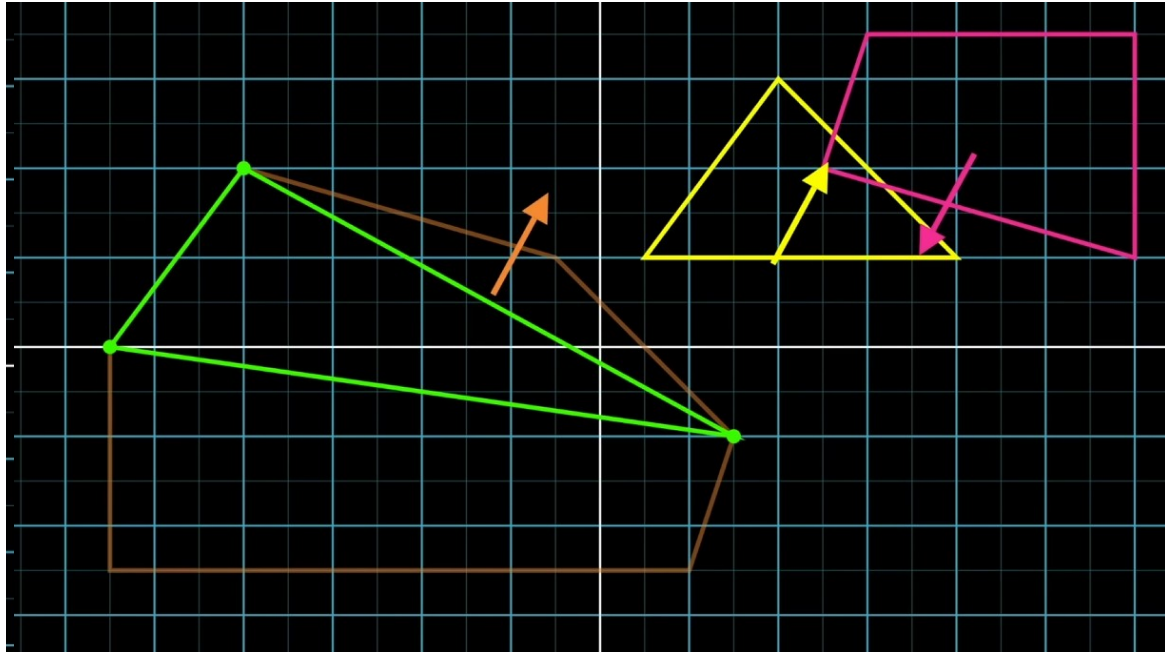
# GJK (Gilbert–Johnson–Keerthi)



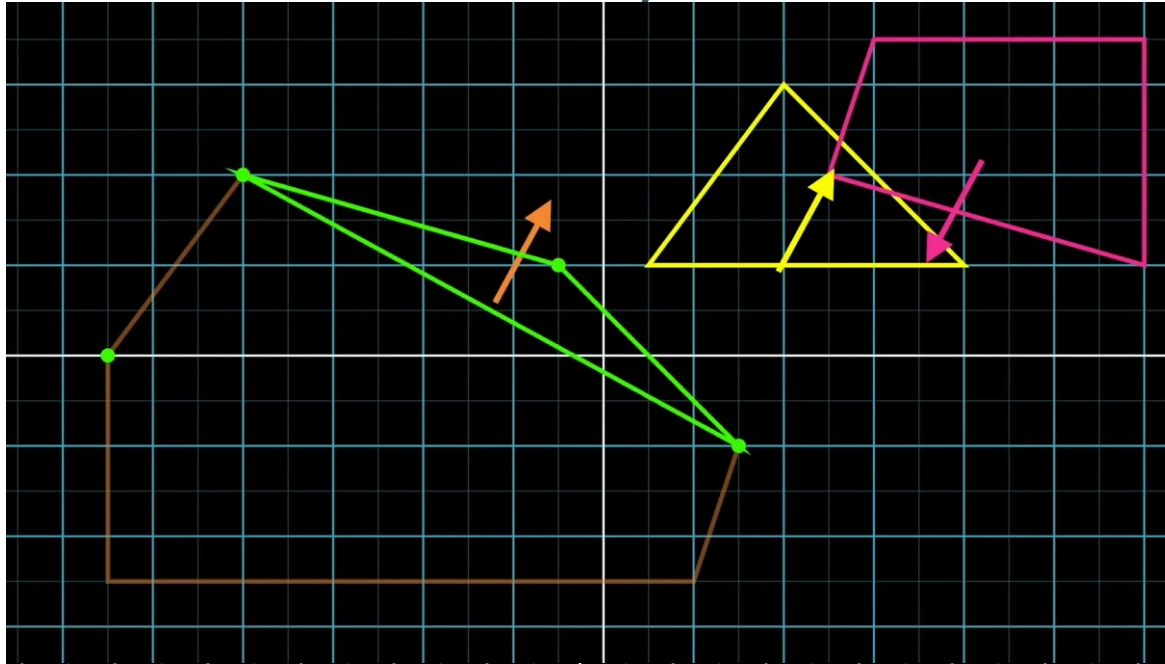
# GJK (Gilbert–Johnson–Keerthi)



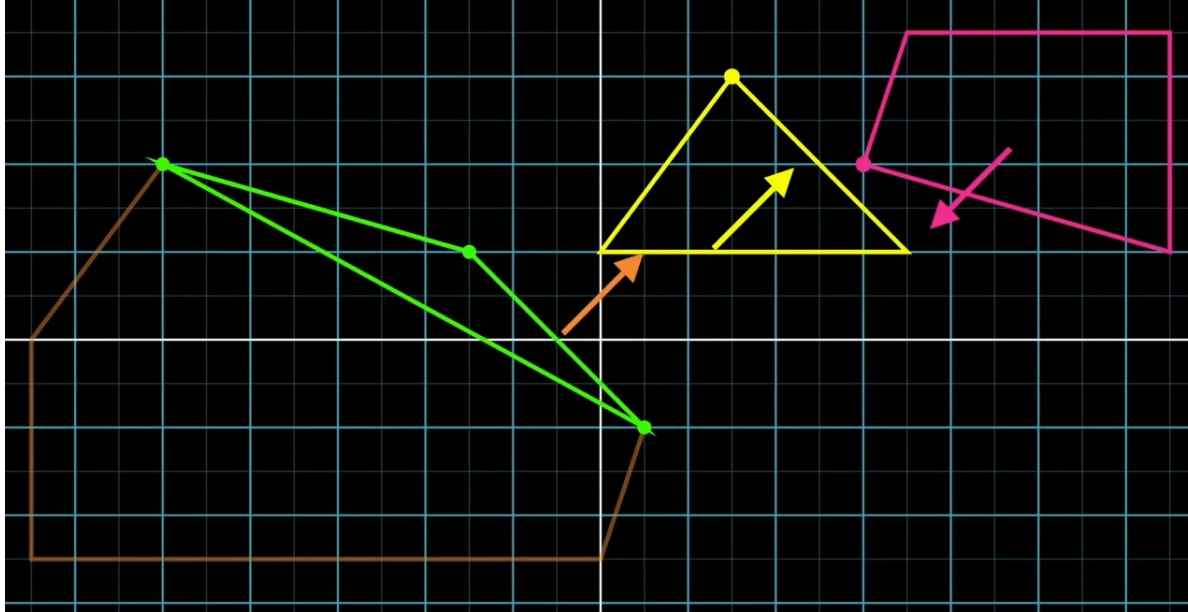
# GJK (Gilbert–Johnson–Keerthi)



# GJK (Gilbert–Johnson–Keerthi)



# GJK (Gilbert–Johnson–Keerthi)





# EPA (Expanding Polytope Algorithm)

- Basiert auf GJK
- <https://dyn4j.org/2010/05/epa-expanding-polytope-algorithm/>

# Demo

<https://winter.dev/articles/gjk-algorithm/app/demo.html>