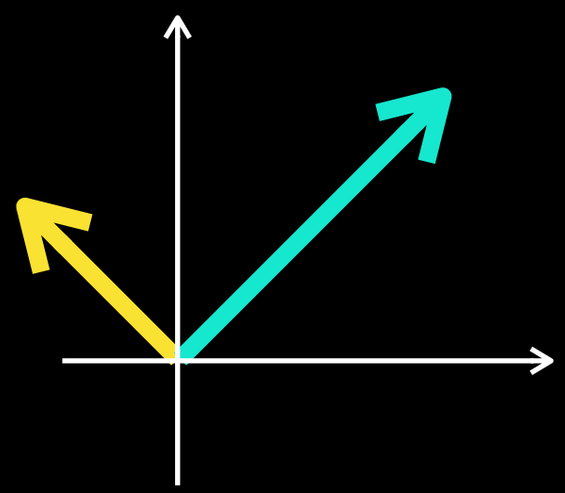
# Robot navigation project

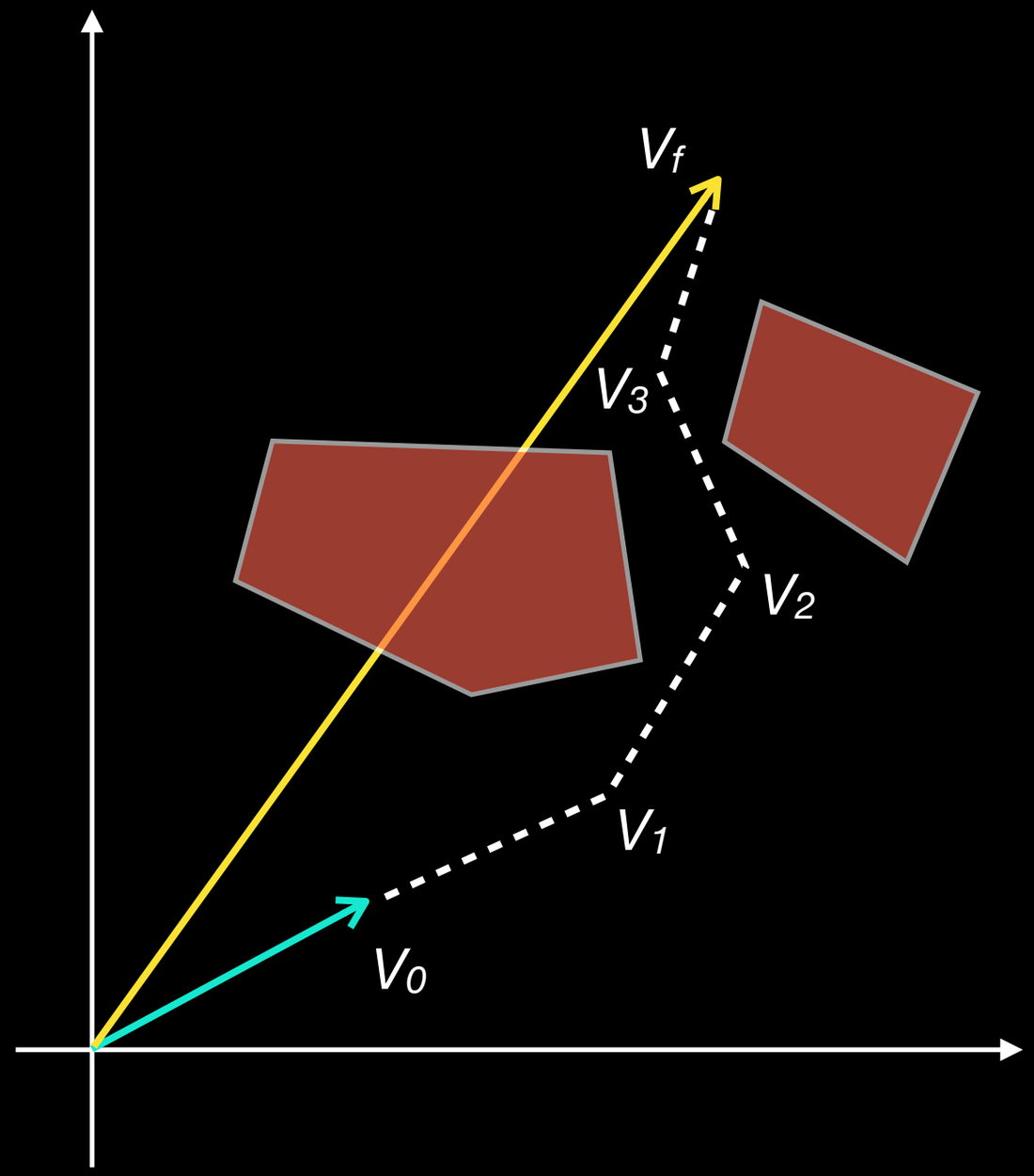
## Linear Algebra Essentials



**Given:**

1. $V_0$, $V_f$
2. Ob - a list of convex polygons that do not intersect with each other

Develop an algorithm that returns the poly line that starts in $V_0$ and ends in $V_f$ and do not intersect any polygon from a given list of polygons Ob.




$[ V_0, V_1, \ldots, V_f ]$

# A simple algorithm

1. $V_c = V_0$, polyline = [ $V_0$ ]

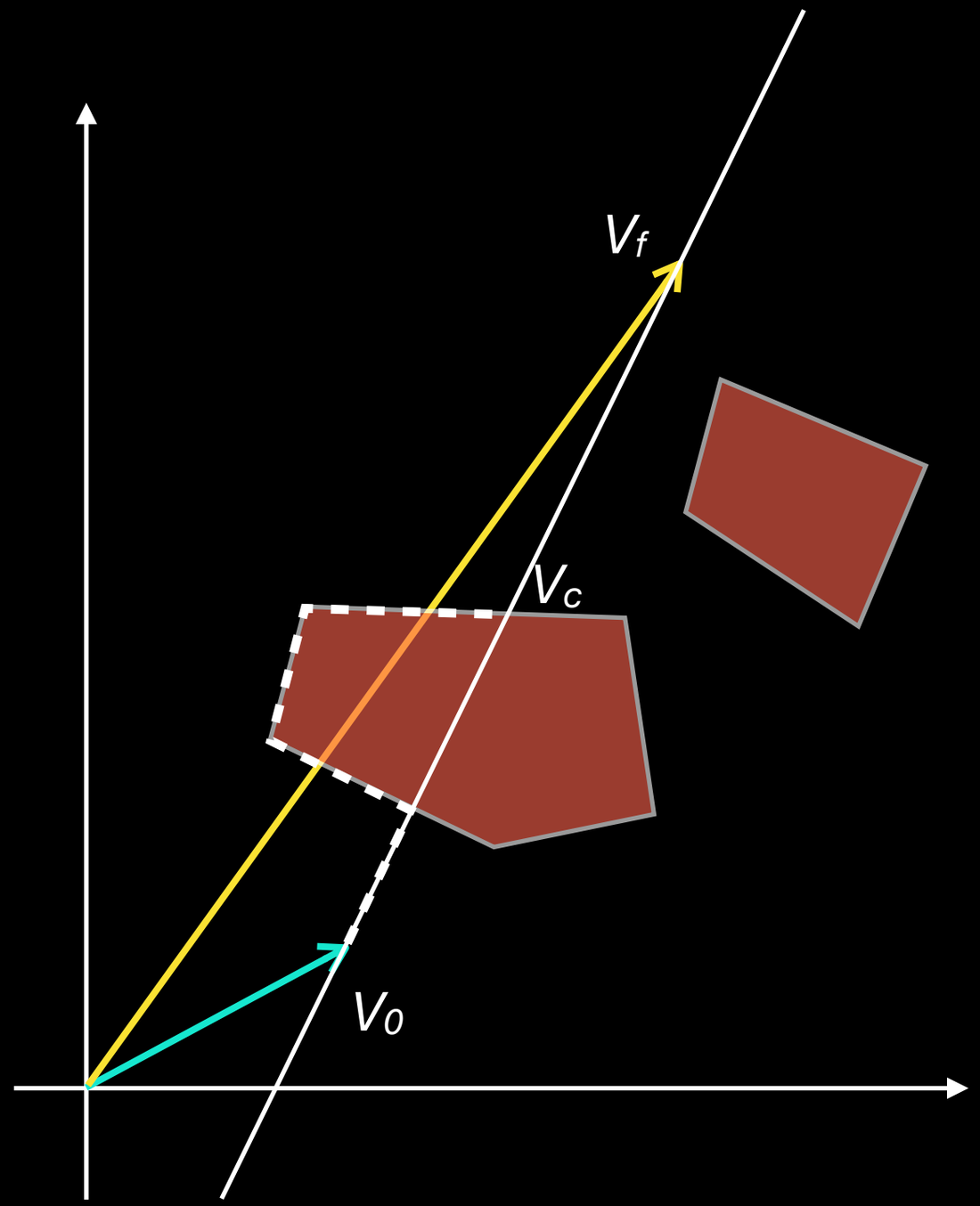
2. Find the line coming through $V_c$ and $V_f$

3. Find all intersections of the line with polygons from the list of obstacles

4a. if there is no intersection, return polyline + [ $V_f$ ]

4b. Otherwise find the vector closest to $V_c$ and append  part of the intersected polygon to the polyline.

5. Update $V_c$ and go to (2)



# Submitting results

robot_navigation.py - the python file you need to submit. You can run it from a command line:  > python robot_navigation.py robot_data.json

robot_data.json - data file containing robot initial position, target point, and the list of obstacles

robot_navigation.ipynb - the notebook containing some code showing how to check your algorithm’s result using helper functions provided