Sequential path planning

**Backwards reachable set:**

**Forward reachable set:**

- 3D obstacles

- 2D obstacles

- option 1:

- option 2: intersect backwards reachable set

Options 1 and 2 are NOT the same! Proven.

**Details for option 1:**

- is obtained from ; this makes a 4D matrix since is 4D

- given some , becomes 3D and can be passed into hamFunc

**Dynamics in detail:**

**How to get**

Given:

For every t, compute , and then .

Stack the 3D matrices

Storage requirements for each vehicle:

* : 4D
* : 4D
* : 4D
* From a quick test, 4 vehicles each using 51 grid points per dimension takes about 4GB of memory… seems doable

Storage requirements for joint state space

* 2 vehicles, 5D total, 41 grid points: 10 GB
  + this would be a good example to use for the journal version
* 2 vehicles, 6D total, 25 grid points: >20 GB

Material in papers:

ECC 2015

* Hamilton-Jacobi variational inequality
* Deterministic formulation
* 4 vehicle example

CDC 2015

* HJ VI
* Formulation with uncertainties
* Backwards reachable set
* Obstacle creation: option 1
* Example from option 1 (without state update)
* State update (take this out in final version?)
* State update example (take this out in final version?)

Unused material

* “Optimal” example deterministic
* “Optimal” example with uncertainties?
* Obstacle creation: option 2
* Example from option 2
* State measurement update
* State measurement update example
* Multiple vehicle types