Lazy_theta_star - a deterministic 3D path planner

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Why another planner?

Standards @ https://xkcd.com/927/
Apply when:

- Large scale: Paths of **100** times the map resolution.
- Repeatability, deterministic
- Online & Onboard UAVs
- 3D

![Actinia oil rig](http://www.shipspotting.com/photos/middle/3/2/3/448323.jpg) 5m 35m 82m 78m
Usage example

Video at
https://drive.google.com/open?id=15VBqKcMIVNcNrZC9pK9w9MgziomsYE2E
How to use it

<launch>

...<node name="lazy_theta_star" type="ltStar_async_node" pkg="path_planning" output="screen" />

...

</launch>

https://github.com/margaridaCF/FlyingOctomap_code
How to use it

**Input Topic**
- std_msgs/Header: header
- int16: request_id
- geometry_msgs/Point: start
- geometry_msgs/Point: goal
- int32: max_time_secs
- float32: safety_margin

**Output Topic**
- std_msgs/Header: header
- uint32: request_id
- bool: success
- uint32: waypoint_amount
- geometry_msgs/Pose[]: waypoints
Octomap

- **Multi-resolution**: merge same state voxels
- **Suitable states**: Free / Occupied / Unknown
- **Light structure**
- **Obstacle avoidance**
- **3D**

Lazy Theta


- **Any-angle**: smoother paths
- **Lazy**: Minimum line of sight checks

http://aigamedev.com/wp-content/blogs.dir/5/files/2013/07/lazy_trace.png
Path planning with Lazy Theta *
References


Proposal video at https://youtu.be/EMfS2IRTazy