

Meeting 2

SLAM applications with Turtlebot

- Application in a factory environment could be monitoring locations of material, tools, and vehicles
- Turtlebots using SLAM can include infrared readings which can map hot spots and heat dissipation coming from a machine/room
- SLAM can optimize paths the turtlebot would take as well as increase the accuracy of its movements

Using SLAM can increase the speed and safety of the Turtlebot. Cliff sensors don't need to be active if the turtlebot already knows the surrounding which can allow it to move at 0.46 m/s

more SLAM application

Article

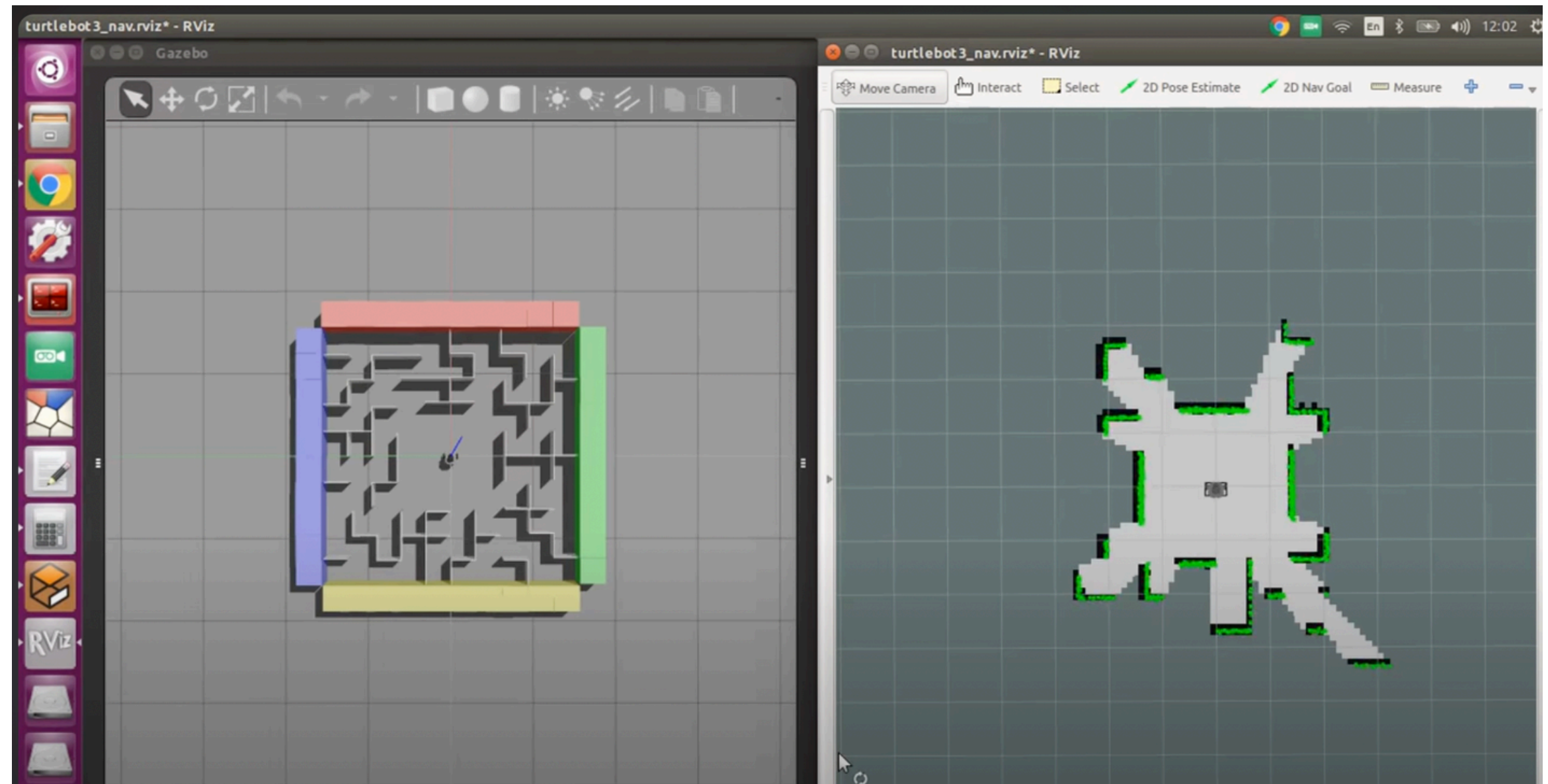
This study addresses the challenges of robotic localization and navigation in visually degraded environments, such as low illumination and adverse weather conditions, by proposing a novel thermal infrared visual SLAM (Simultaneous Localization and Mapping) algorithm.

Idea for a demonstration using SLAM

Create a SLAM Maze Cracker

- Turtlebot maze solver that senses environment through laser scans and navigates

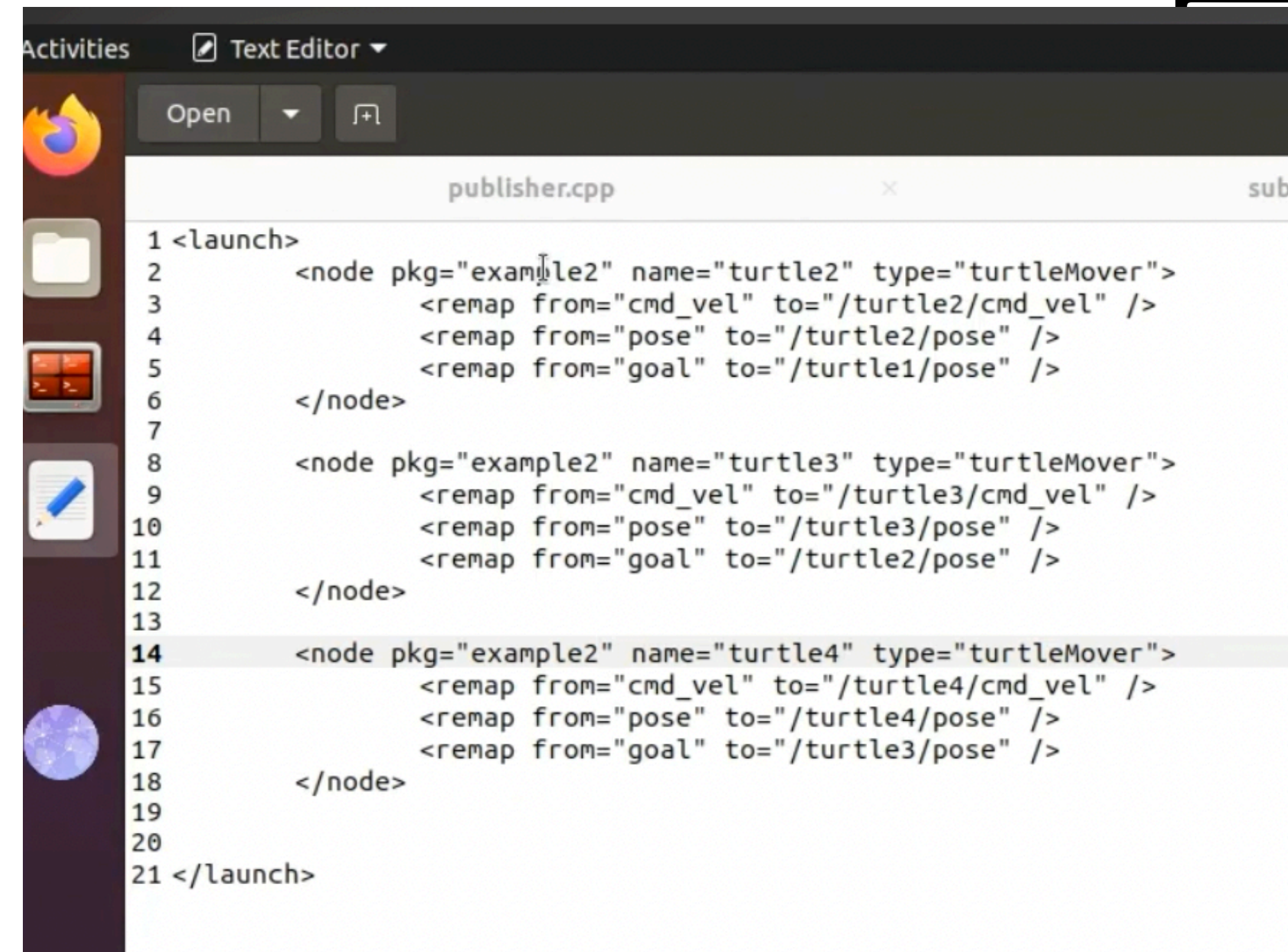
Github



Communication with multiple Turtlebots

- ROS 2 allows an unlimited amount of turtlebots to connect to each other and 1 controlling PC (in practice the more there are the slower the system is till eventually stops)

[Video demonstrating how to connect multiple turtlebots](#)

A screenshot of a Linux desktop environment showing a text editor window titled 'publisher.cpp'. The editor contains ROS 2 launch XML code for three turtlebots. The code is as follows:

```
1 <launch>
2     <node pkg="example2" name="turtle2" type="turtleMover">
3         <remap from="cmd_vel" to="/turtle2/cmd_vel" />
4         <remap from="pose" to="/turtle2/pose" />
5         <remap from="goal" to="/turtle1/pose" />
6     </node>
7
8     <node pkg="example2" name="turtle3" type="turtleMover">
9         <remap from="cmd_vel" to="/turtle3/cmd_vel" />
10        <remap from="pose" to="/turtle3/pose" />
11        <remap from="goal" to="/turtle2/pose" />
12    </node>
13
14    <node pkg="example2" name="turtle4" type="turtleMover">
15        <remap from="cmd_vel" to="/turtle4/cmd_vel" />
16        <remap from="pose" to="/turtle4/pose" />
17        <remap from="goal" to="/turtle3/pose" />
18    </node>
19
20
21 </launch>
```

The text editor has a dark theme and a sidebar on the left with icons for Activities, Text Editor, and other applications. The code is line-numbered from 1 to 21.

Communication with multiple Turtlebots

- Multiple turtlebots can add to the SLAM map and use it together
- They can connect using the same wifi network or wired LAN
- Turtlebots can share information like maps, tasks, or positions for collaborative navigation or exploration