Hochschule
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University of Applied Sciences

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Introduction to ROS

Foundation Course

August 20, 2019

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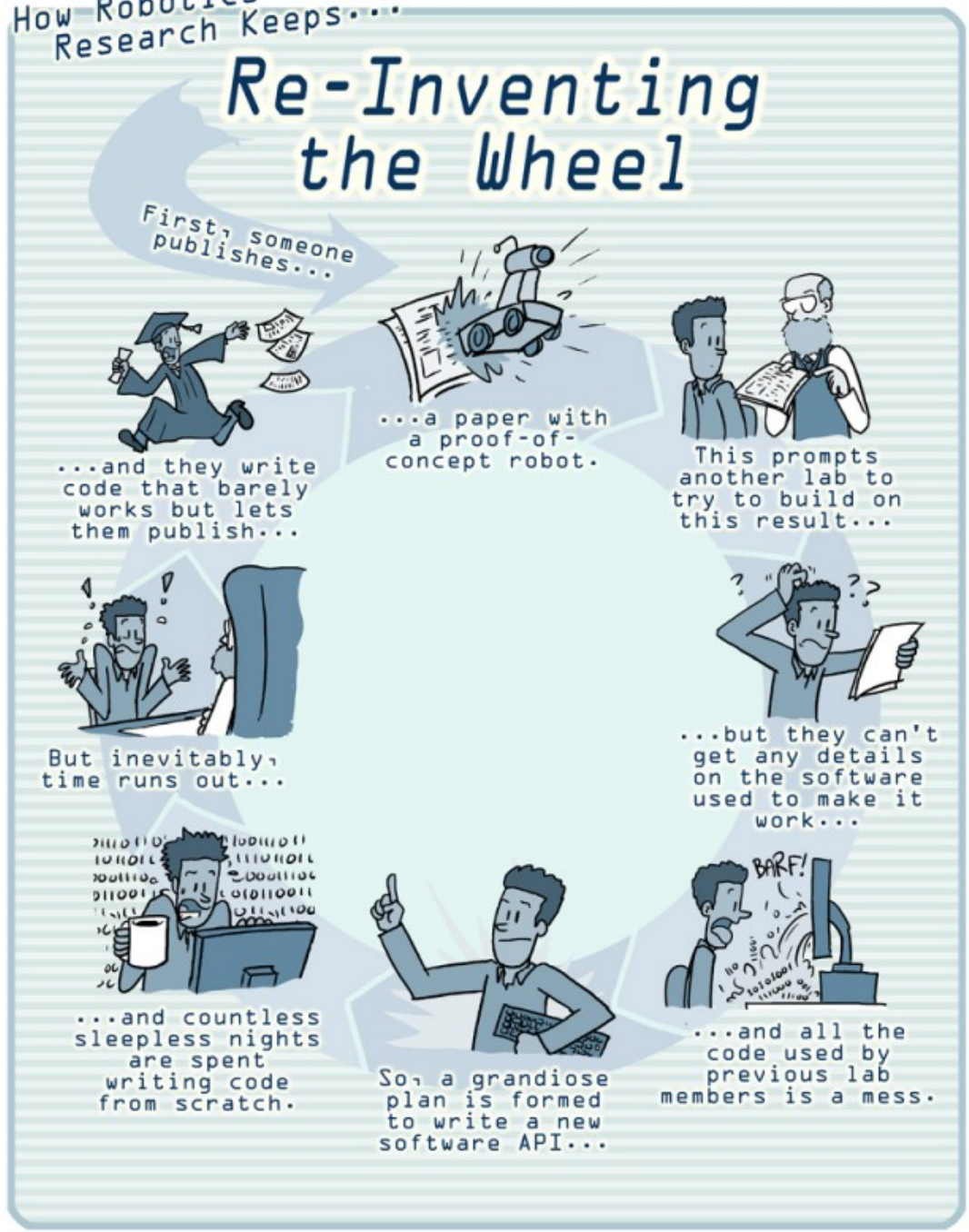
What ROS is

Robot Operating System

- Short for: Robot Operating System.
- A collection of libraries and tools.
- It helps software developers create robot applications.



http://www.willowgarage.com/blog/2010/04/27/reinventing-wheel

What ROS is

Robot Operating System

- A way to standardize writing software for robots.
- It enhances code reusability  .
- ROS is open-source  .
- It is a meta-operating system.
- ROS can be installed on Ubuntu and Debian (so it's currently supported on Linux only).

What ROS is NOT

Robot Operating System

- It is NOT a programming language.
- It is NOT an integrated development environment (IDE).
- It is NOT a stand-alone operating system

1. What is ROS?
1.1 What ROS is
1.2 What ROS is NOT

2. Analogy Between ROS and Operating Systems

3. Features of ROS
3.1 Language independent
3.2 Distributed and Modular
3.3 A lot of libraries and tools
3.4 Open Source
3.5 Active Community

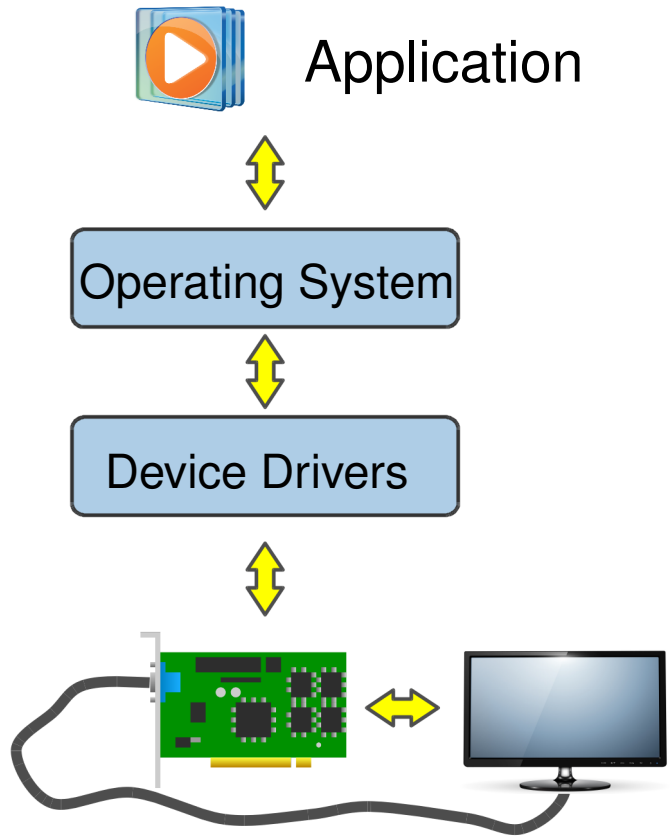
Analogy Between ROS and Operating Systems

Software Applications

work on

Different hardware

Analogy Between ROS and Operating Systems



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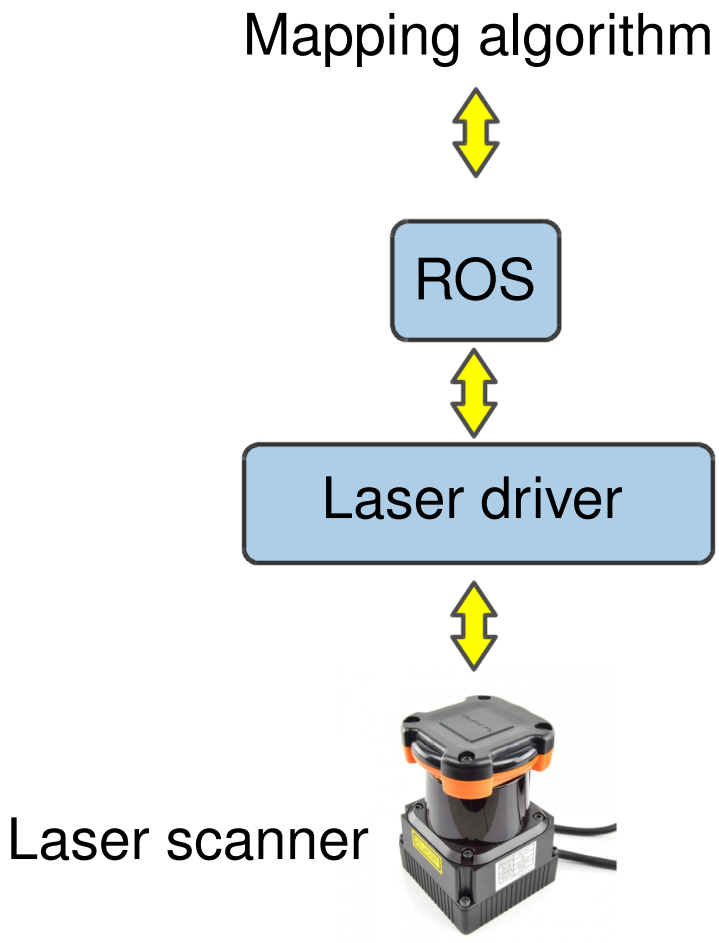

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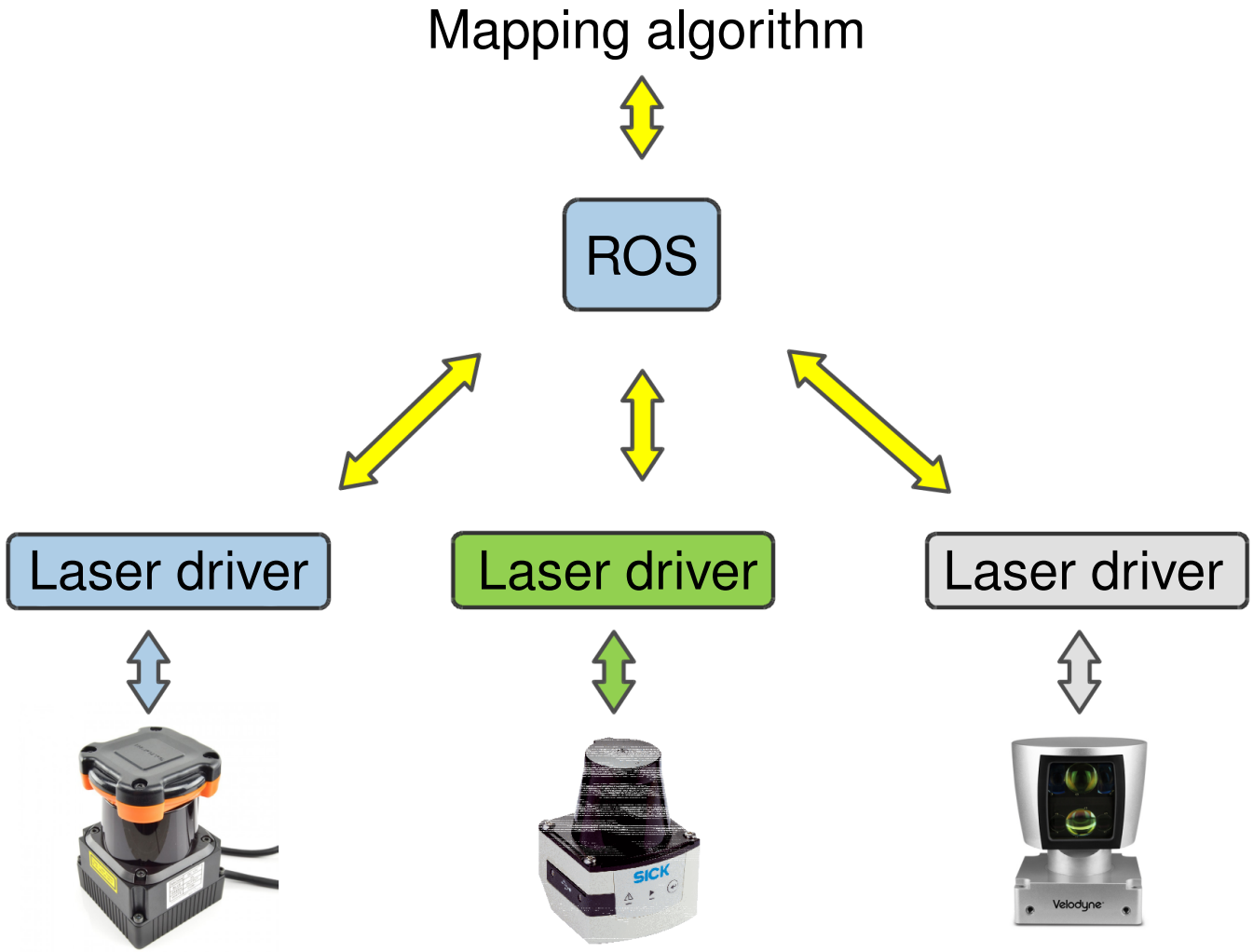

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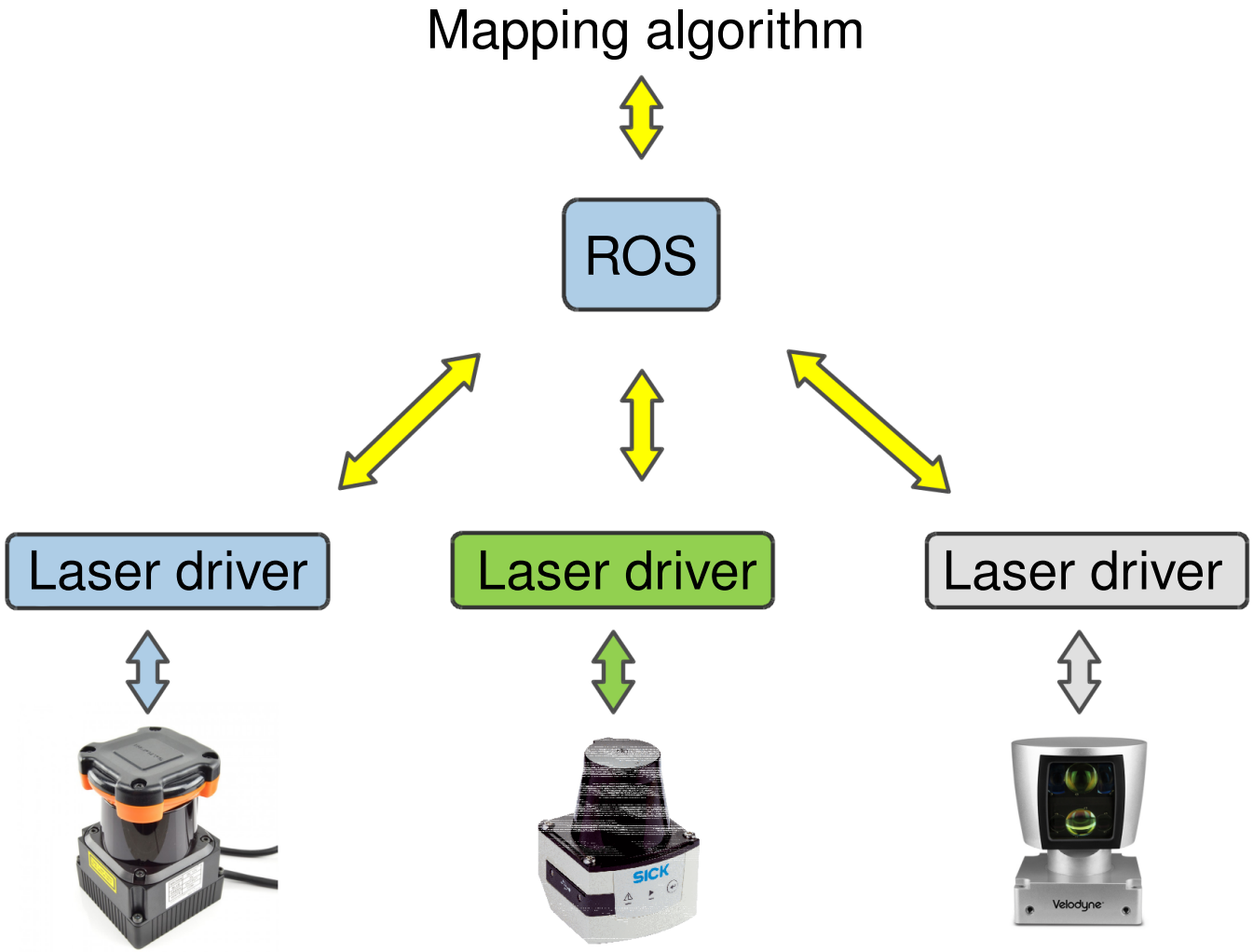

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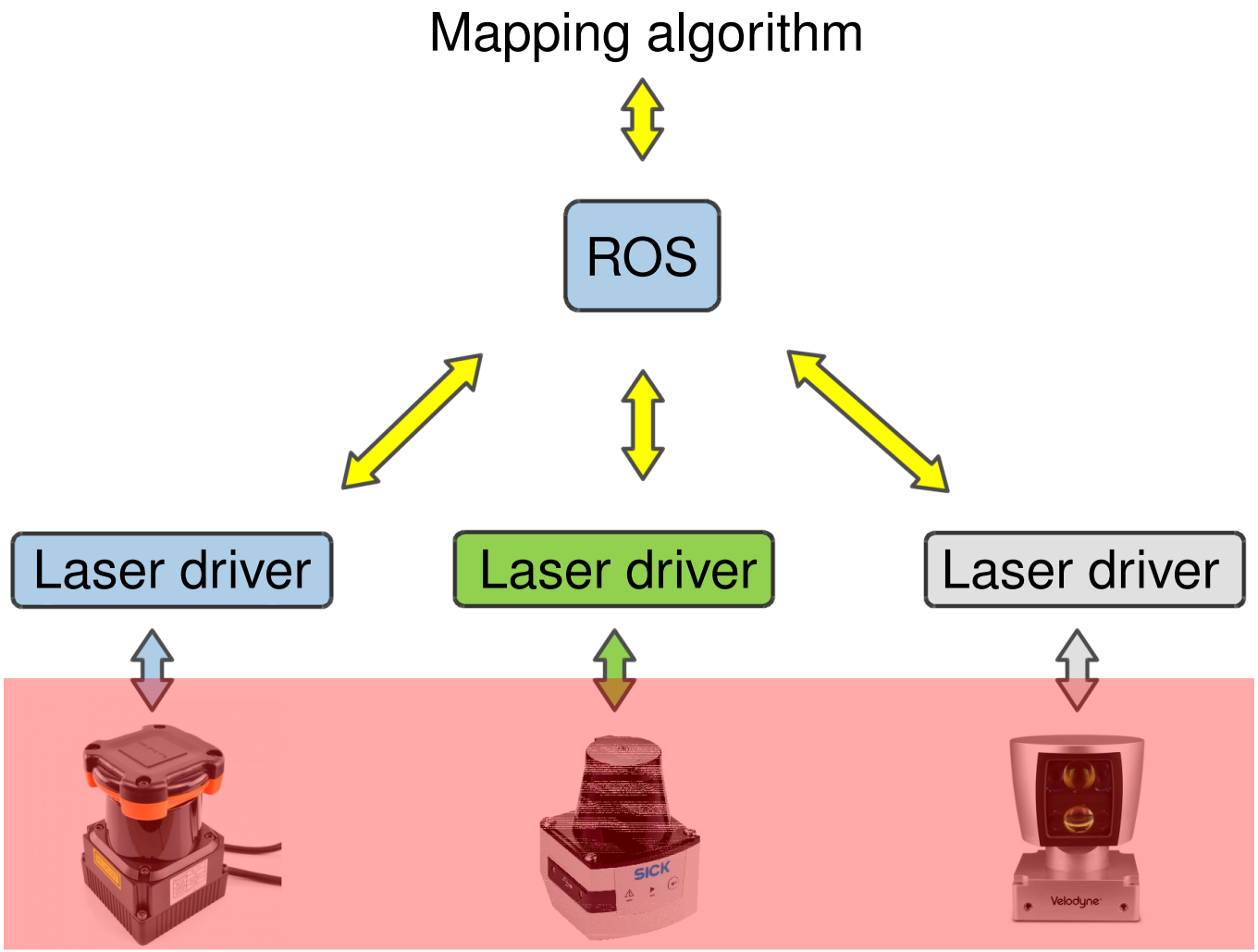
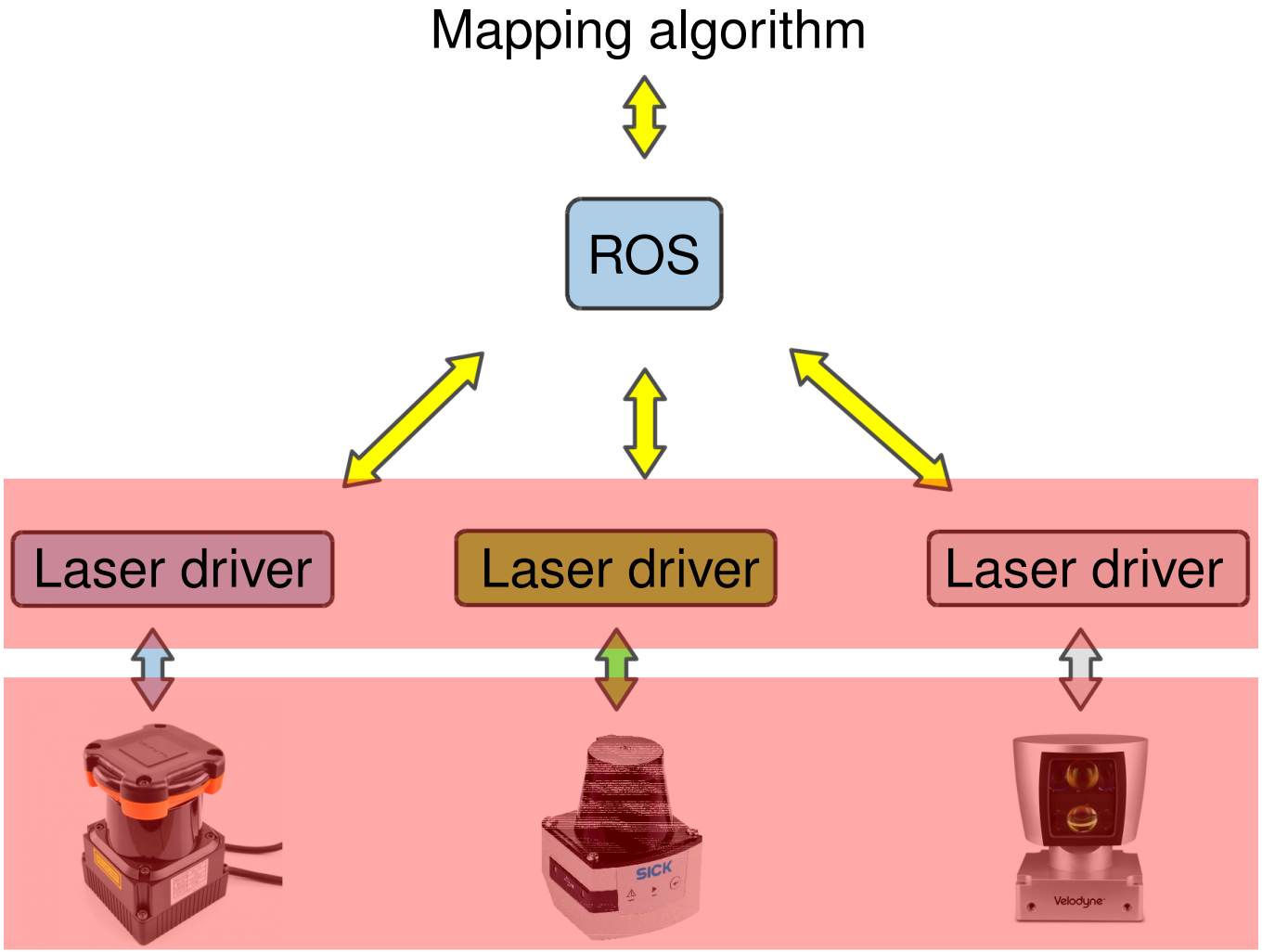


Different hardware

Analogy Between ROS and Operating Systems



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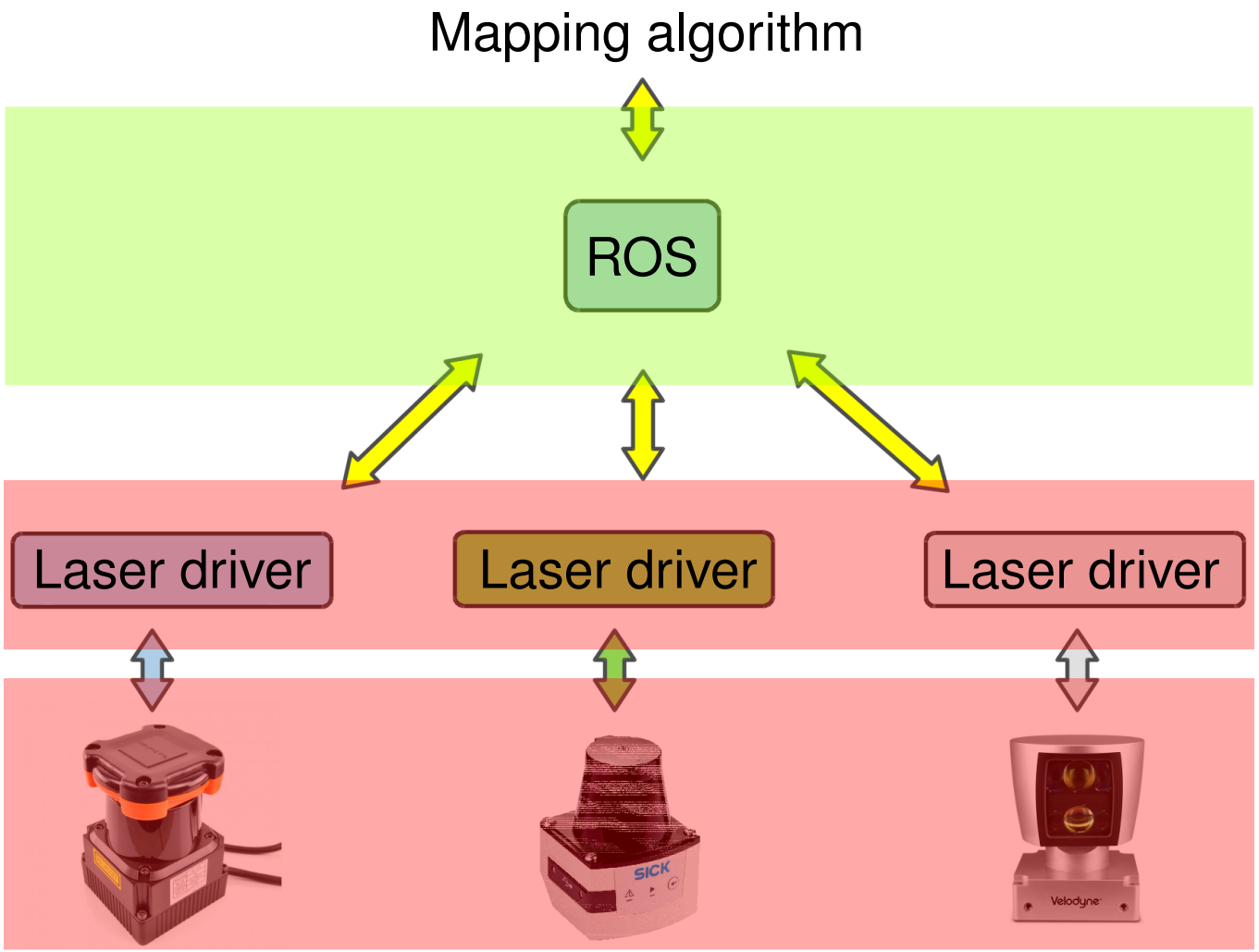
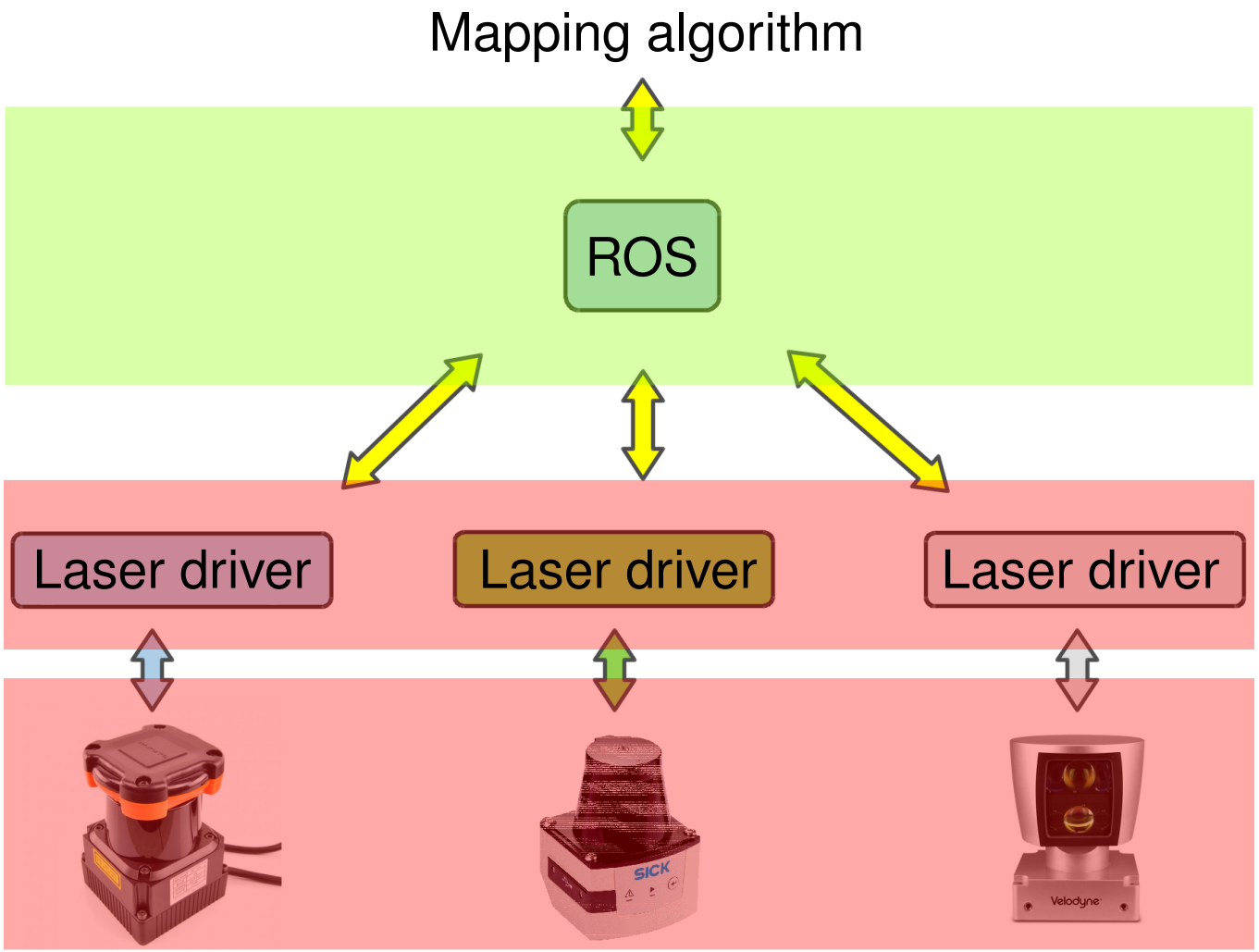


Data received in the same message format

Different drivers

Different hardware

Analogy Between ROS and Operating Systems



Analogy Between ROS and Operating Systems

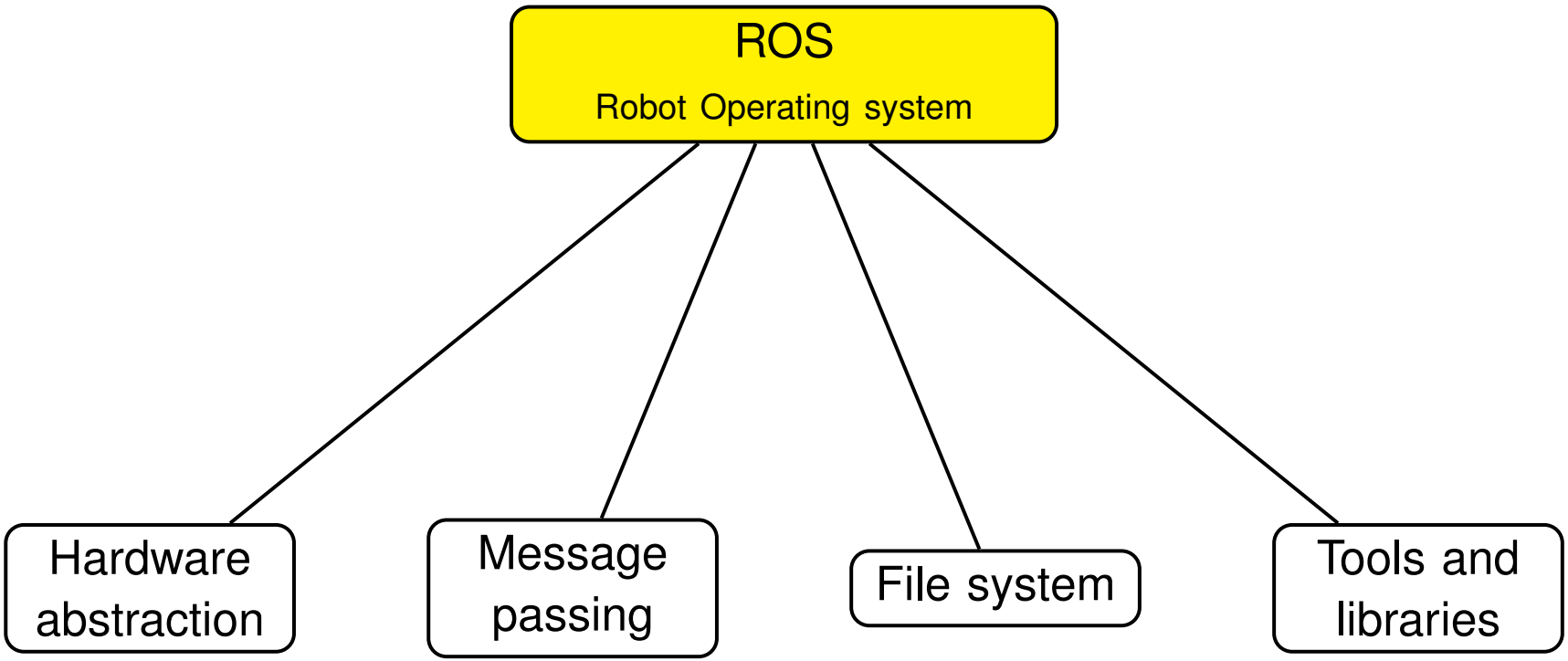
Mapping | Navigation | pick & place

Robot Applications

work on

Different hardware

Analogy Between ROS and Operating Systems



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Features of ROS

- Language independent.
- Distributed and Modular.
- A lot of libraries and tools.
- Open Source.
- Active Community.

Features of ROS

Language independent

- ROS functionalities are implemented as a library in different programming languages.
- These libraries are referred to as ROS client libraries.

Features of ROS

Language independent

ROS client libraries.

- Main ROS Client libraries:
  - roscpp
  - rospy
  - roslisp
- Experimental ROS client libraries:
  - rosjava
  - rosruby
  - and some others..
- ROS support on MATLAB:
  - Robotics System Toolbox