

# GMAR Robotics School 2021

*Draft; do not publish*

## Organization

- Date: tentatively 2021-08-23 - 2021-08-27 (Monday-Friday)
- Location: [Villa Blanka](#); Innsbruck
- Topic: Mobile Manipulation

Audience:

- advanced Master and young doctoral students in subject areas related to robotics (engineering, computer science, etc.)
- 15-25? participants, depending on the location
- prerequisite: familiarity with ROS, to be specified; recommend tutorials

Concept:

- hands-on, making things work on real robots
- technical lectures concentrated near the beginning of the week
- hacking starting day one, growing in importance as the course advances
- hacking in small teams dedicated to specific functionalities
- some application talks towards the end, not relevant to the hacking

Implementation Goal:

- SLAM, autonomous navigation
- vision-based grasping of (known and/or unknown?) objects from known locations
- placing objects in designated locations
- execution of high-level plans involving the above capabilities

Robots:

- 1 mobile base + arm [platform](#) for each group of 3-4 students
- or, 1 UIBK mobile manipulator (homebrew base with DOBOT M1 ? Franka Emika Panda)
- or, TUW Honda mobile manipulator

## Schedule

Each session lasts 90 minutes; blank = hacking.

| Sessions            | Monday                                                                 | Tuesday                                                            | Wednesday                                                        | Thursday                                                                                      | Friday                            |
|---------------------|------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------|
| <b>Morning I</b>    | Mechatronics of mobile manipulators (Johannes Gerstmayr or Colleague*) | Robot Vision (Markus Vincze or Colleague *)                        |                                                                  | Industry event + Robotics talks event in <b>Alpbach</b> . Departure at 8.30am, return 15.30pm | Task Planning (Gerald Steinbauer) |
| <b>Morning II</b>   | Kinematics (Andreas Müller*)                                           | Human-Robot Interaction and Safety Aspects (Mathias Brandstötter*) | SLAM/Navigation (Incubed IT) if not in Bozen <b>Who does it?</b> |                                                                                               | Hacking: <b>Team competition?</b> |
| <b>Afternoon I</b>  | Dynamics, Control (Wolfgang Werth*)                                    | Picking and Placing (Justus Piater*) - Needed?                     | Hacking: Navigation in ROS                                       |                                                                                               |                                   |
| <b>Afternoon II</b> | Hacking: Set-up the robots                                             | Hacking: Path/Motion Planning in ROS                               |                                                                  |                                                                                               |                                   |
| <b>Dinner</b>       | on site                                                                | on site                                                            | on site                                                          | in town                                                                                       | -                                 |

\* confirmed

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