

Table a- Table with information about available tools

Name of the SW tool	Brief description	Related deliverable	Type of tool	Targeted Challenge	Instructions for download
Generic motion planner	Obstacle avoidance and planning algorithms (probabilistic roadmap PRM, rapidly exploring random trees RRT)	D6.1	C++ Code, with Python bindings, GUI and Corba interface	All	https://humanoid-path-planner.github.io/hpp-doc
Interface for planning from sensor localization	Planner initial and object positions can be set from sensor input using middleware interface	D6.1	Corba interface wrapping HPP core algorithms	All	https://github.com/humanoid-path-planner/hpp-corbaserver
Planner for fixed manipulator	Sampling-based planner (PRM, RRT) dedicated to fixed manipulator.	D6.3	C++ Code with Python-Corba interface. Documented by a tutorial dedicated to Challenge 1	C1	https://humanoid-path-planner.github.io/hpp-doc/download.html (tab Euroc C1) https://www.youtube.com/watch?v=eY1Zjy2uHfc
Inverse kinematics	Modular real-time IK tool for redundant robots, handling singularities and multiple tasks	D7.1	C++ libraries, ROS middleware	C1	https://dms-prext.fraunhofer.de/livelink/livelink.exe?func=ll&objaction=overview&objid=9656356
CoMuRoSim	Motion planning from a list of tasks in the context of coordinated control of cooperative multi-robot systems	D7.1	MATLAB code	C1	https://dms-prext.fraunhofer.de/livelink/livelink.exe?func=ll&objaction=overview&objid=9656743 https://dms-prext.fraunhofer.de/livelink/livelink.exe?func=ll&objaction=overview&objid=9656176
Grasp synthesis based on dynamic properties	Finds optimal grasp configurations based on the object's dynamic properties	D6.3	MATLAB Code	C1	https://dms-prext.fraunhofer.de/livelink/livelink.exe?func=ll&objaction=overview&objid=9657236
Contact planning (for manipulation)	Sampling-based planner (PRM, RRT) dedicated to dynamic systems working in contact. The planner can generate sequences of nonrolling contacts for a dexterous hand manipulating an object	D6.2	C++ code with documentation	C1, C2	https://github.com/humanoid-path-planner/hpp-rbprm https://youtu.be/ejsRA7Rz5O4
Force Control Design Tool	The tool is an aid for the design of position-based force control algorithms.	D7.3	MATLAB code	C1, C2	https://dms-prext.fraunhofer.de/livelink/livelink.exe?func=ll&objaction=overview&objid=9657237
Planner for mobile manipulator	Sampling-based planner (PRM, RRT) dedicated to mobile	D6.3	C++ Code with Python-Corba	C2	https://humanoid-path-planner.github.io/hpp-doc/download.html (tab Euroc

	manipulator.		interface. Documented by a tutorial dedicated to Challenge 2		C2) https://www.youtube.com/watch?v=7vCd9VD7LwE
Collision avoidance	Potential field based approach for implementing a self-collision avoidance; can be activated in torque controlled operation mode of the arm	D7.2	Integrated Library	C2	Challenge II team SVN
Capability map	Reachability analysis of the robot; Access to the capability map of the platform for approach position calculation and manipulability heuristics	D6.4	Integrated software library	C2	Challenge II team SVN
Object detection	3D-data based scene parsing; toolchain from CAD-Data to localization of objects in depth images	D5.1	Integrated software library	C2	Challenge II team SVN
Wrench estimator	Momentum-based estimator of external wrench and unmodeled dynamics for UAVs	D7.2	C++ code	C3	https://dms-prext.fraunhofer.de/livelink/livelink.exe?func=II&objaction=overview&objid=9658762
Planner for UAVs	Sampling-based planner (PRM, RRT) dedicated to underactuated UAVs like quadcopters	D6.1	C++ Code with Python-Corba interface. Documented by example scripts dedicated to Challenge 3	C3	https://github.com/jmirabel/hpp-quadcopter https://www.youtube.com/watch?v=ruuXjAQAD1s
RotorS	A MAV gazebo simulator	D4.3	C++ gazebo library	C3	https://github.com/ethz-asl/rotors_simulator
Mav Planning Utils	Plans smooth minimum snap trajectories for use in MAV path planning	D6.1	C++ library	C3	https://github.com/ethz-asl/mav_planning_utils
Multi-Sensor Fusion	Time delay compensated single and multi sensor fusion framework	D5.2	C++ library	C3	https://github.com/ethz-asl/ethzasl_msf
Volumetric Mapping	A repository for 3D volumetric (occupancy) maps, providing a generic interface for disparity map and pointcloud insertion, and support for custom sensor error models.	D5.3	C++ library / ROS node	C3	https://github.com/ethz-asl/volumetric_mapping
Ros Vrpn Client	Ros interface for vicon that rejects outliers and uses an EKF to	D4.3	C++ ROS node	C3	https://github.com/ethz-asl/ros_vrpn_client

	estimate trajectories				
Rovio	Robust visual inertial odometry	D5.3	C++ ROS node	C3	https://github.com/ethz-asl/rovio
Vehicle Monitor (MAV saver)	System for automatically detecting collisions of MAVs and unsafe states	D4.3	C++ ROS node	C3	https://github.com/ethz-asl/euroc_stage_2/tree/master/vehicle_monitor
Vicon depthcam Calib	Small tool for calibrating the offset between a depth camera and Vicon markers	D5.2	C++ ROS node	C3	https://github.com/ethz-asl/vicon_depthcam