Transition

SYSTEM

Click on item to be directed to the reference webpage.

* 1. [Robotic Operating System](http://www.ros.org/)
     + [ROS Turtorials](http://wiki.ros.org/ROS/Tutorials)
     + [Creating packages](http://wiki.ros.org/ROS/Tutorials/CreatingPackage)
     + [Dealing with catkin make files and packages](http://wiki.ros.org/catkin/CMakeLists.txt)
     + [Subscribing and publishing messages](http://wiki.ros.org/ROS/Tutorials/WritingPublisherSubscriber(c%2B%2B))
     + [Catkin make modes and related speed issues](https://answers.ros.org/question/200155/how-to-debug-executable-built-with-catkin_make-without-roslaunch/)
     + Packages used in our system: [Image transport](http://wiki.ros.org/image_transport/Tutorials), [OpenCV](http://wiki.ros.org/cv_bridge/Tutorials/UsingCvBridgeToConvertBetweenROSImagesAndOpenCVImages) (Cv\_bridege – incorporates OpenCV into ROS)
     + [Message files](http://wiki.ros.org/msg)
     + [Launch files](http://wiki.ros.org/roslaunch/XML)
     + [Rosbags/Rosplay](http://wiki.ros.org/rosbag)
  2. Active Omni-Directional Treadmill
     + Image processing system –
       - FlyCap2 – how to find parameters for launching the node from the application
       - Setting parameters through launch file
       - How to obtain images from camera to image processing node (Refer to Image transport)
       - How OpenCV is integrated into the node
       - AOT kinematics
       - Tolerance
     + Dynamixel Motors
       - [Dynamixel SDK](https://github.com/ROBOTIS-GIT/DynamixelSDK) to test and debug code, setting ID – Can also be done using the GUI manager
       - Controlling Dynamixel using OpenCR (if needed)
       - Initializing motors, torque, setting USB rules and permissions
         * [Dynamixel 64AT Control Table](http://support.robotis.com/en/product/actuator/dynamixel/mx_series/mx-64(2.0).htm)
       - Writing and reading data to and from the motors – Refer to Dynamixel SDK examples. The package can be downloaded from Dynamixel’s GitHub page (Link is given above)
       - [Dynamixel SDK Tutorial Video 1](https://www.youtube.com/watch?v=F-sXbIAM0jc)
       - [Dynamixel SDK Tutorial Video 2](https://www.youtube.com/watch?v=zb8I05D-LGE)
       - [Dynamixel SDK Tutorial Video 2](https://www.youtube.com/watch?v=J0xIwmxg-MQ)
     + Publishing messages to the mobile robot topic - [“/cmd\_vel”](http://wiki.ros.org/Robots/TIAGo/Tutorials/motions/cmd_vel)
     + Recording data
       - [fstream](http://www.cplusplus.com/reference/fstream/fstream/) and associated functions
       - [Common errors:](http://umich.edu/~eecs381/handouts/filestreams.pdf) not closing the file, wrong file name etc
     + [Multi threading and incorporating it in ROS](http://wiki.ros.org/roscpp/Overview/Callbacks and Spinning)
  3. Mobile robot
     + OpenCR – uploading codes and debugging – common errors faces
     + Arduino environment
       - Turtlebot\_Core\_Mod program
       - Mobile robot kinematics
       - Subscribing to linear and angular velocities and writing it to the motors
     + Recording position of the mobile robot using the encoder data
       - Subscribing to “sensor\_state” messages

MISCELLANEOUS

* [Linux/UNIX Tutorials](http://www.ee.surrey.ac.uk/Teaching/Unix/)