

# Bust a Funky Move!

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## Finding the Joints

We use the AR Pose ROS package for fiducial tracking. It publishes the position of each fiducial in 3D space to a ROS topic.

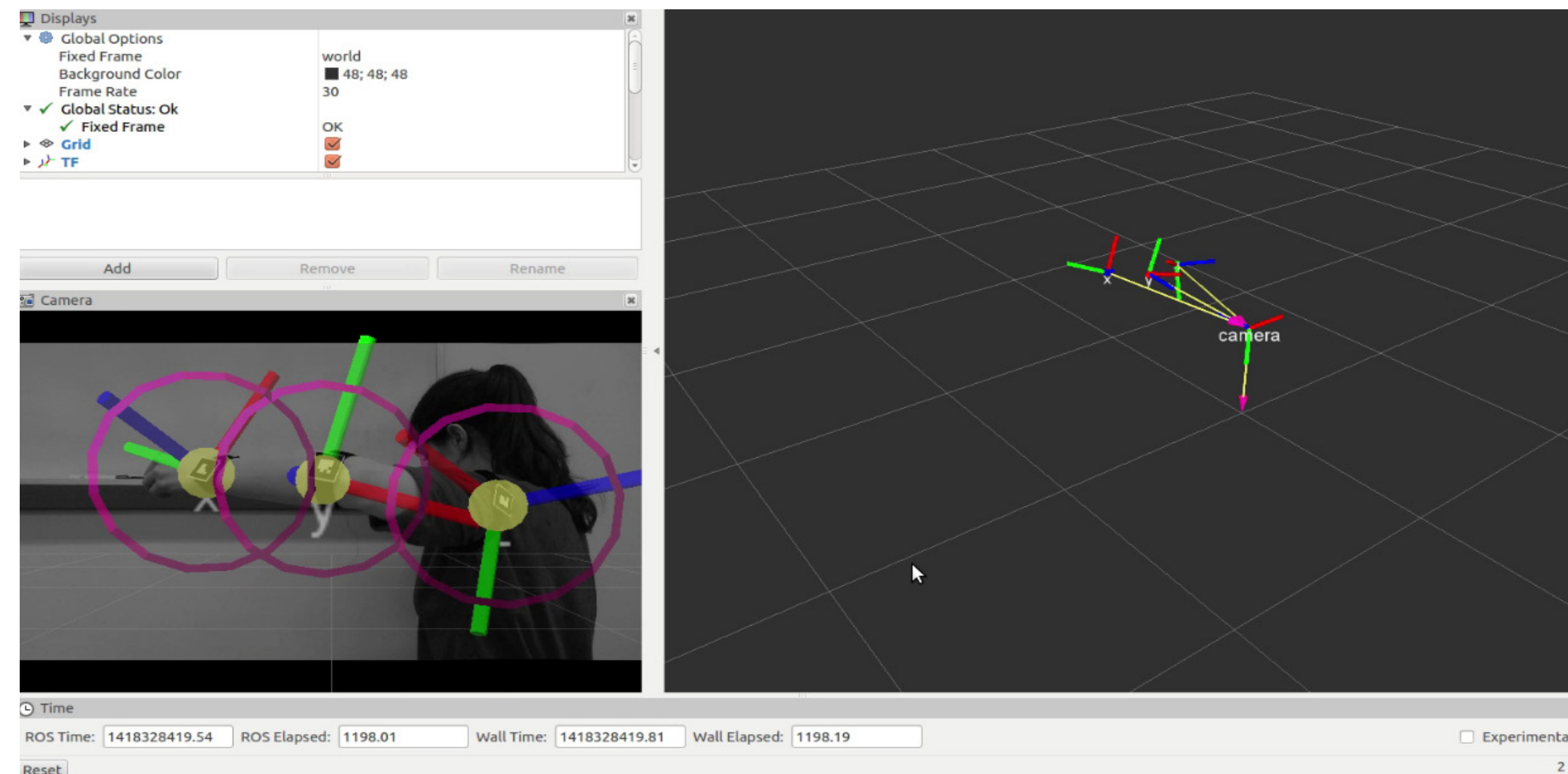


Figure 1: Rviz showing ar\_pose tracking three fiducials

## Dynamic Motion Primitives

Dynamic Motion Primitives (DMPs) are differential equations which characterize the “building blocks” of motion. Our system uses DMPs to characterize the arm motion between starting and ending point.

$$\tau \dot{v} = K(g - x) - Dv - K(g - x_0)s + Kf(s)$$

$$r \dot{x} = v$$

$$f(s) = \frac{\sum_i w_i \psi_i(s)s}{\sum_i \psi_i(s)}$$

$$\tau \dot{s} = -\alpha s$$

guaranteed to converge

We learn these weights.

nonlinear exciting bit!

## Learning the Moves

The system diagram below shows the four step process from human arm wiggle to robot mimicry. We use the the ST R17 Robotic Arm with a python wrapper for Robofourth.

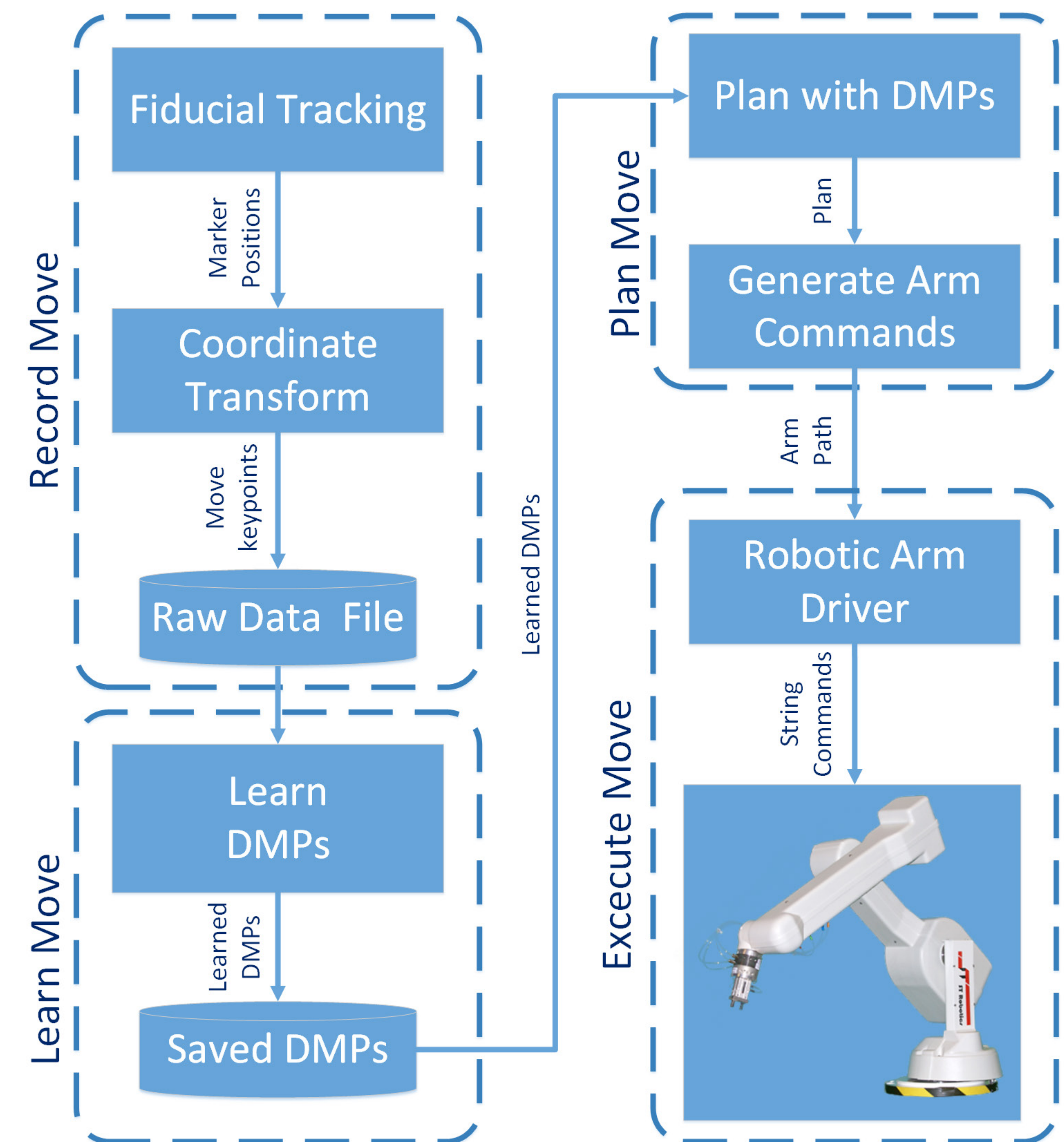


Figure 2: System diagram