Example of **moveTo** task definition

move compliantly { // _with task frame directions_

 * X_t: velocity motion profile, tolerance 0.01 m/s
 * Y_t: position tube 0.03 m
 * Z_t: position tube 0.03 m
 * aX_t:
 * aY_t: } no specification / orientation tube 10 deg
 * aZ_t:

} Objective (Error) function

} until: * goal area reached, tolerance 0.03 m
        * F_x/F_y/F_z > 0.5 N
        * time > 20 sec

} Monitors (FSM)

Controller

$X_d, \dot{X}_d$ → Error Function (In Task Frame) → $E, E_{x,v}$ → ABAG → $\vec{u}(\%)$ → Max Command → α_T, β_T → $^B T_T$ → α_B, β_B → Vereshchagin → $q, \dot{q}, \tau$ → Robot → $q, \dot{q}$

X_p ← Prediction (Integrate Velocity) ← $X_m, \dot{X}_m$ ← Forward Kinematics

$\dot{X}_m$

Error Function (In Task Frame)

Current Speed Error

$\dot{X}_{x,d}$ → $-$ → $\dot{X}_{x,e}$ → abs(e_v) <= σ_v ? 0 : e_v → $E_{x,v}$

$\dot{X}_{x,m}$

Predicted Pose Error

X_d → ⊗ → $X_{e,p}$ → Logarithmic Map (Decoupled) → $\dot{X}_e$ (Error Twist) → abs(e_i) <= σ_i ? 0 : e_i → E

X_p

ABAG

$E, E_{x,v}$

$E_{x,v}$ → 1D ABAG
E_y → 1D ABAG
E_z → 1D ABAG
$E_{x,a}$ → 1D ABAG
$E_{y,a}$ → 1D ABAG
$E_{z,a}$ → 1D ABAG

→ $\vec{u}(\%)$

Prediction (Integrate Velocity)

X_m

$X_{predicted}$ ← ⊗ ← $X_{relative}$ ← Compose Pose ← $R_{relative}$ ← Exponential Map ← $\dot{X}_a$

T_p (Time Horizon)

$\dot{X}_l (P_{relative})$ ← ← $\dot{X}_{scaled}$ ← ⊗ ← $\dot{X}_m$