

PROJECT PLAN

Basic interface task

$k_i =$

$k =$

$k_d =$

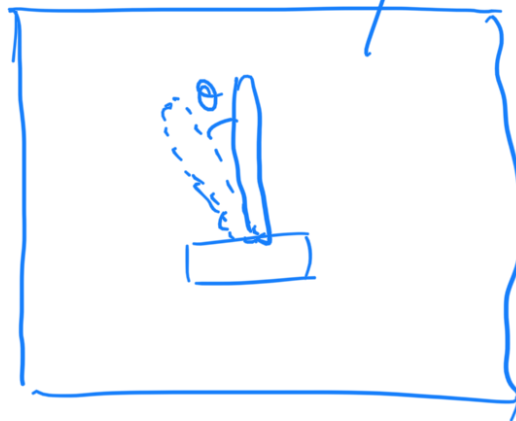
PID
Control
parameters
entered by
users
(in non-interactive
mode)



1D input

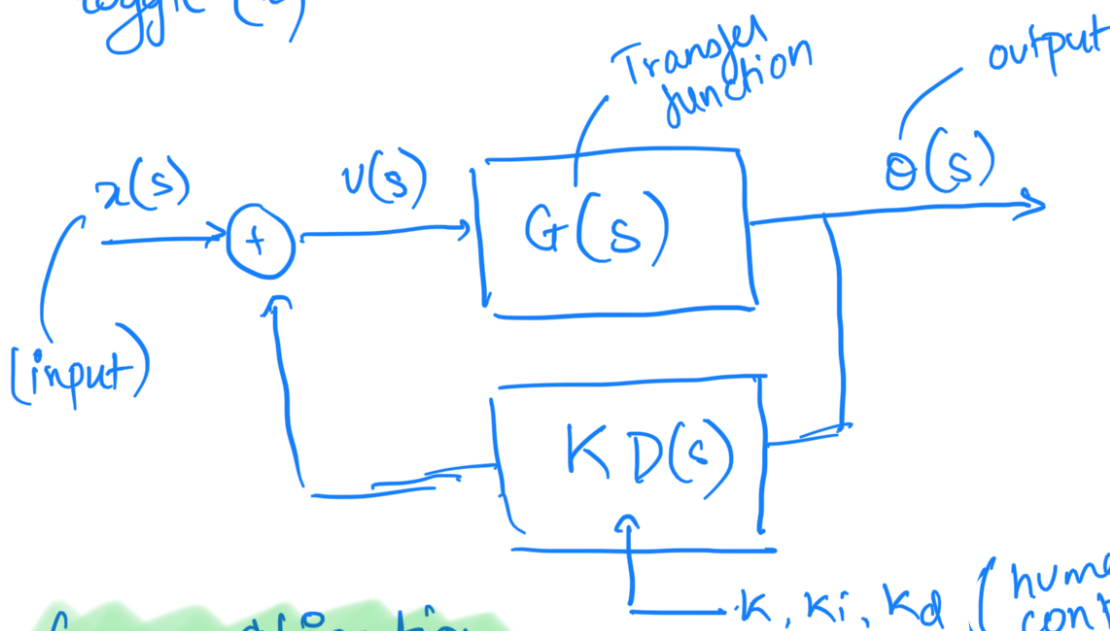
↳ position
of mouse

⇒ position of
toggle (x)



output
screen

↓
moving
pendulum

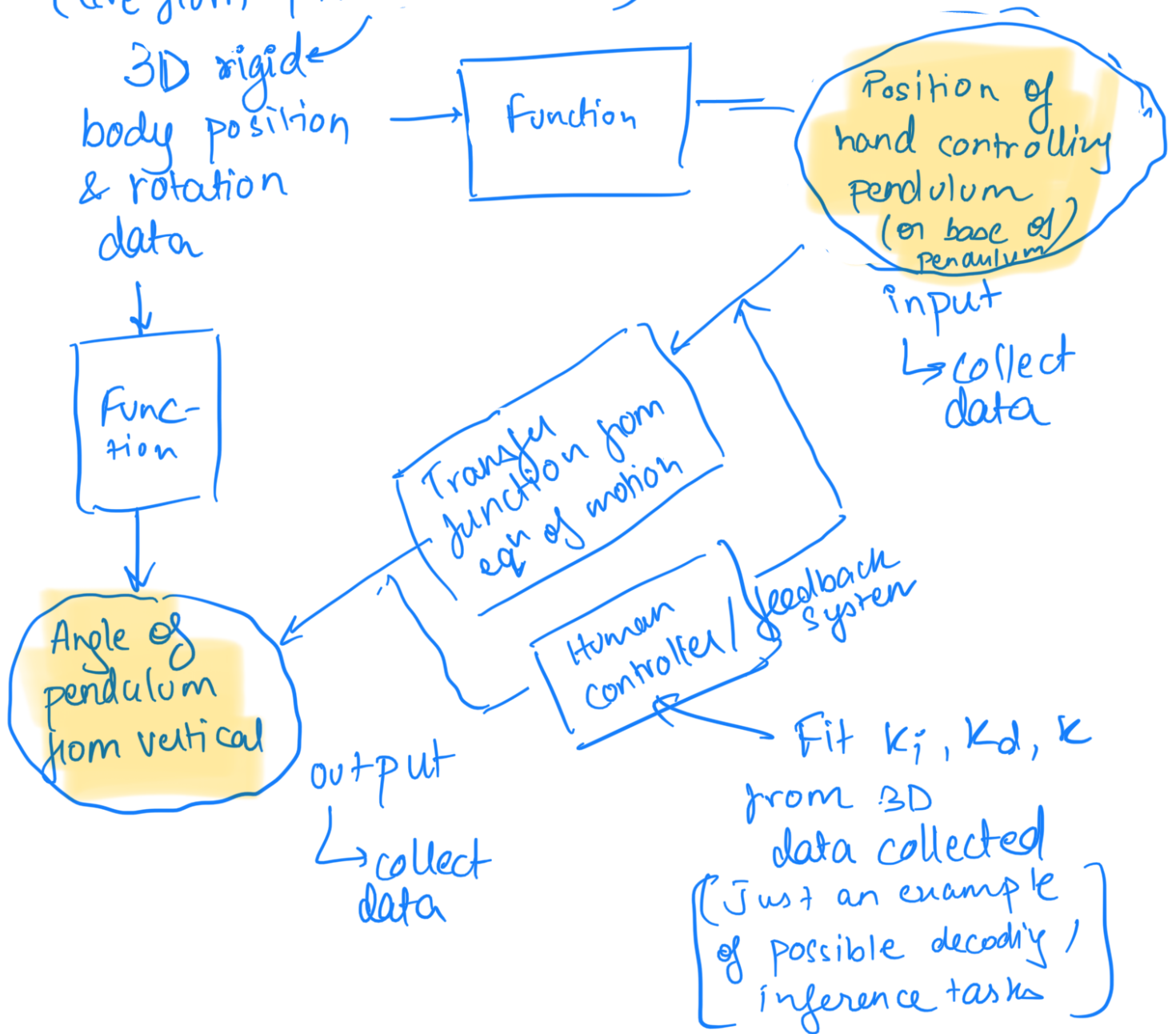


Generalisation

(10 ... with random)

k, k_i, k_d (human
controller)
or can be
pre set

(Live from optitrack with cameras)



Approach : Collect data of subjects trying to balance inverted pendulum

↳ Also collect data of subject interacting with a simulated interface of inverted pendulum task

↳ Fit model to infer control parameters with observed inputs & outputs

↳ Are humans inherently similar controllers
(in 2D vs 3D)

↳ Measure variability across controllers
(How different humans can be modelled as
controllers and is there an underlying
similarity / variation pattern across
subjects)

↳ Can also use full body data
to try and fit a model between
human performance measures (balance, dexterity,
etc)
to inferred control parameters and
see which behaviour corresponds to
which kind of control

↳ Can explore several potential
ideas (This is where our projects
could be individualised)

Aims for the term

Irrespective of final aims, we need 2 things to work by the end of the term to be in a place to perform experiments in lent:

① A simulated inverted pendulum game that can be controlled by moving hand (live data from optitrack) across a 2D plane (eg - a flat table)

② Live data of a subject wearing the suit trying to balance an actual inverted pendulum tracked by markers along with renders.