

Lecture 1

Computational (Algorithmic) Robotics

" specify a task to be

carried out " by a robot

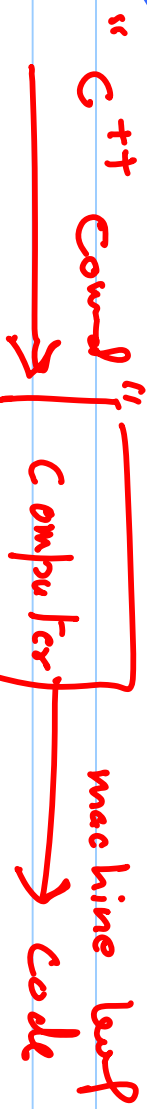
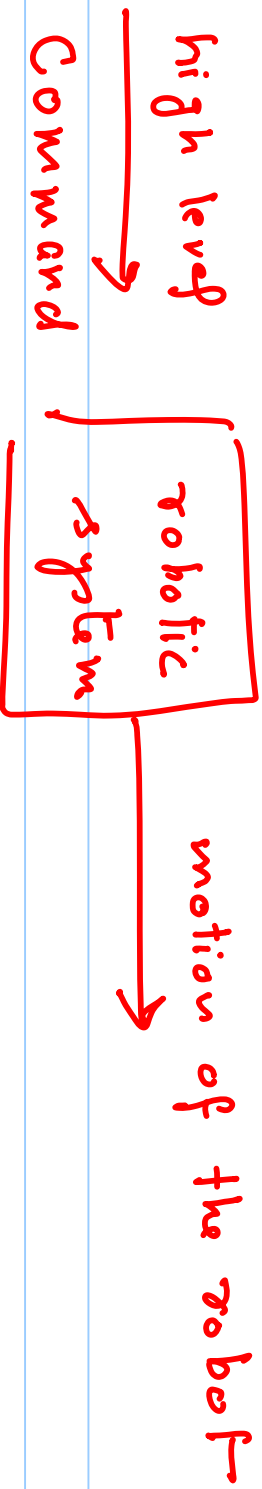
in " high level " description

→ Assembly

→ " Personal Robotics "

→ go fetch a
cup of coffee

enable this



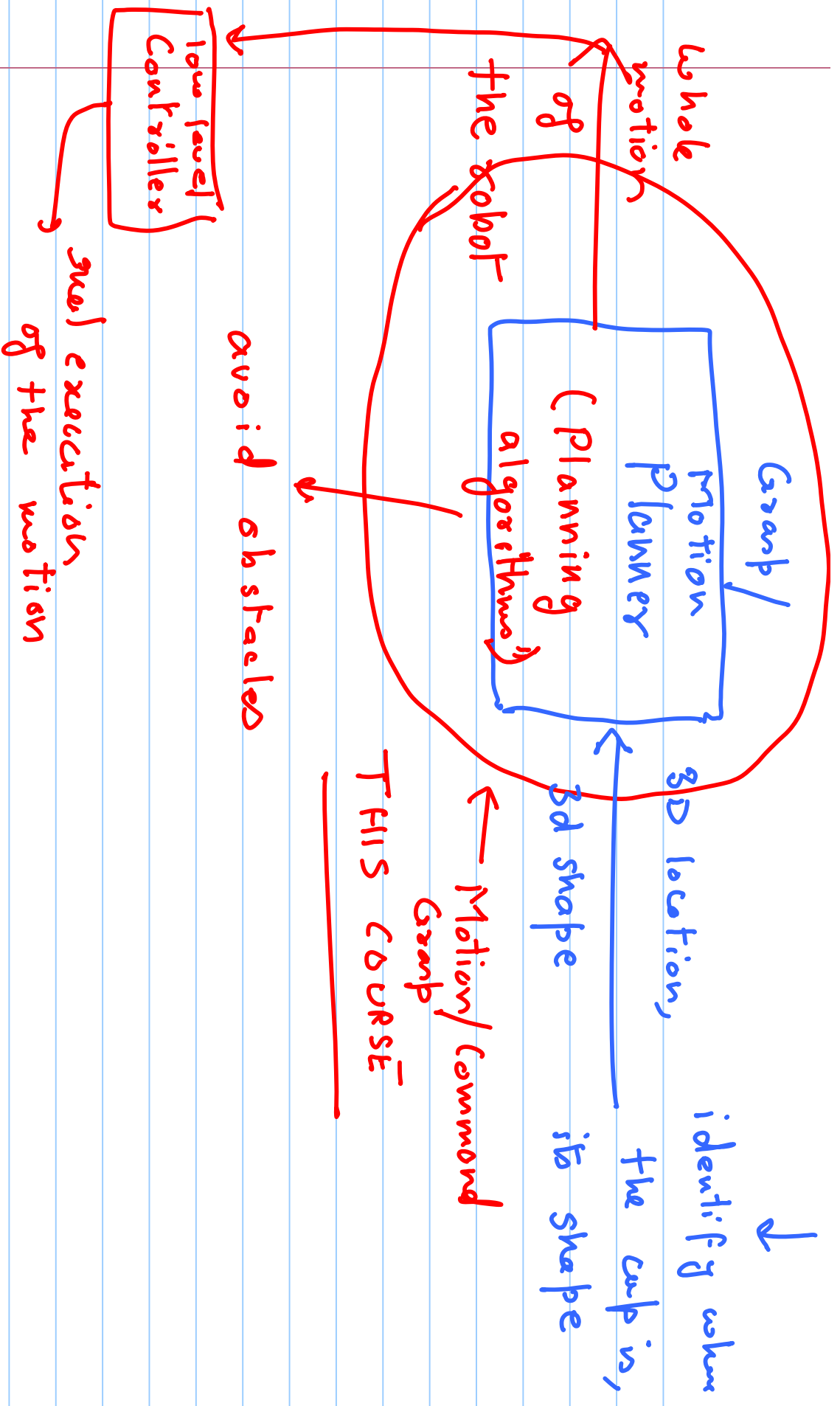
Components of this system

(AI) Natural (Symbolic)

longer

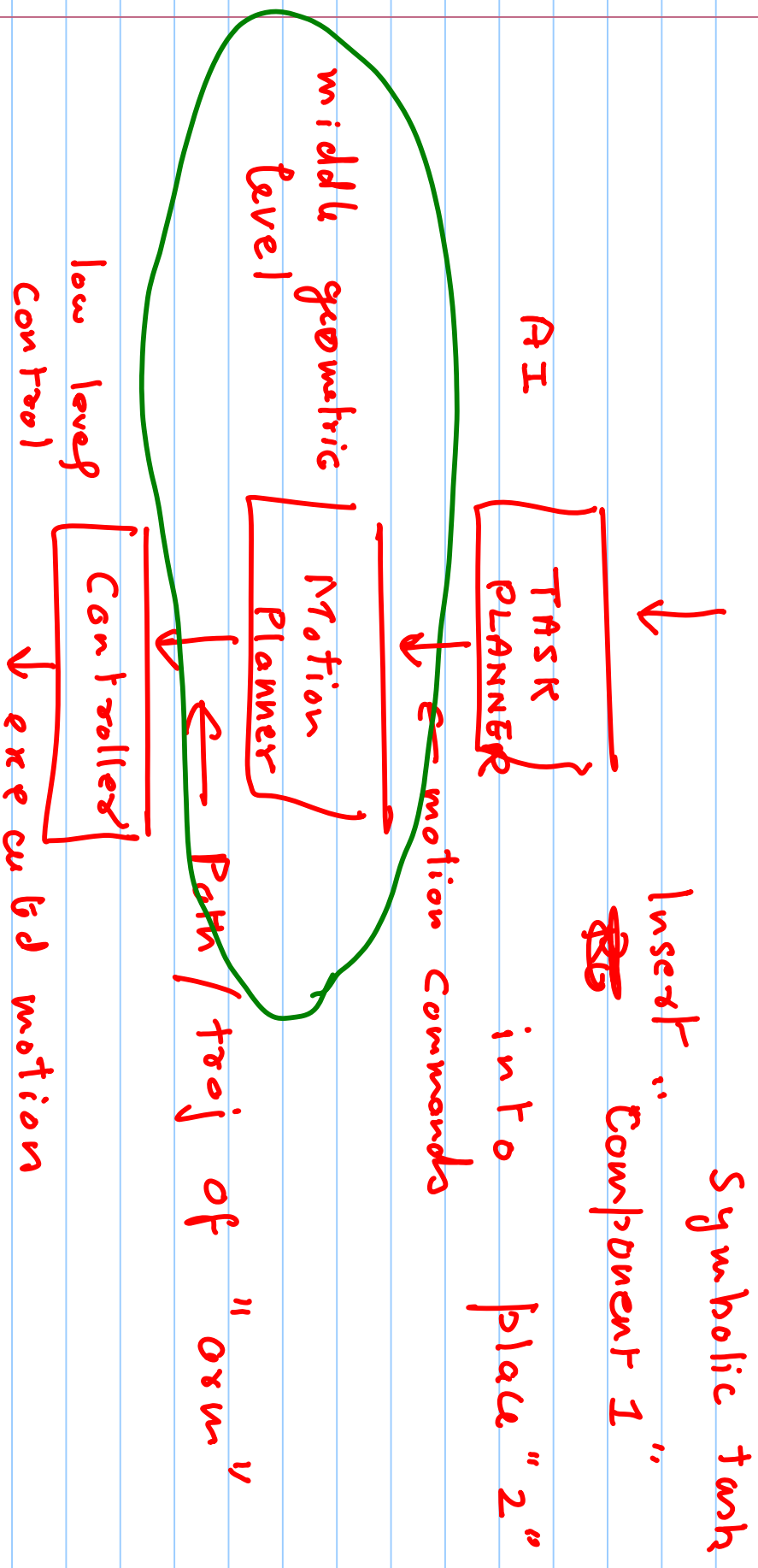
cup desc.

(Sensors) → image processing

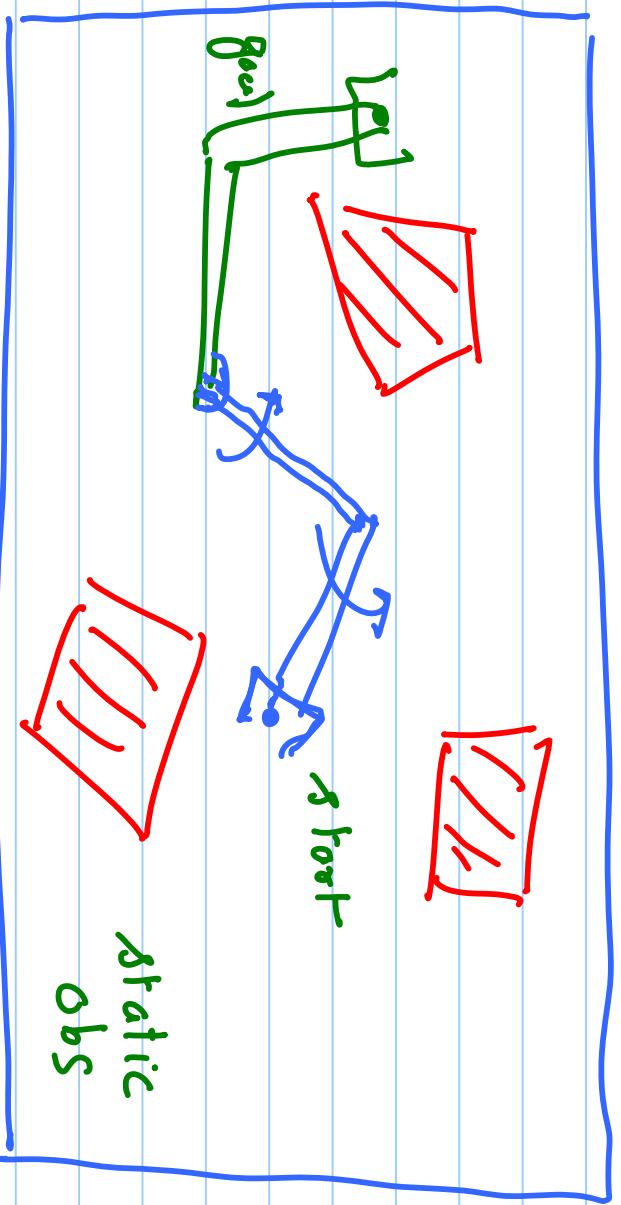


(Assembly Domain)

Simplified version → KNOWN ENVIRONMENT



"BASIC Motion Planning Problems"



Extensions :

- ① UNKNOWN Environment
- ② Uncertainty in motion
- ③ Grasping
- ④ moving obstacles

Background material

- ① algorithmic complexity

✓
~~first~~
Quarter
of
the
course

② geometry (Computational)

③ mechanics → (kinematics)

④ basic mathematical notions
"distance"

Discard → Course "parts/phases"

Evaluation

Project also

- refer to
- ① Course Description
 - ② Detailed outline

~~Read~~ Reading for next week:

- ① basis of algorithmic complexity
 - ↳ \log notation, NP complete problems

- ② Complexity of NP problems
- ↳ paper

Komal will send tonight via e-mail pdf files.

Background material / texts / soft:

See ① ~~see~~ Description.pdf

② Detailed-outline.pdf

on course website,

www.ense.sfu.ca/~komal

Next class : MPPK

(Motion Planning kernel)
develops motion plans