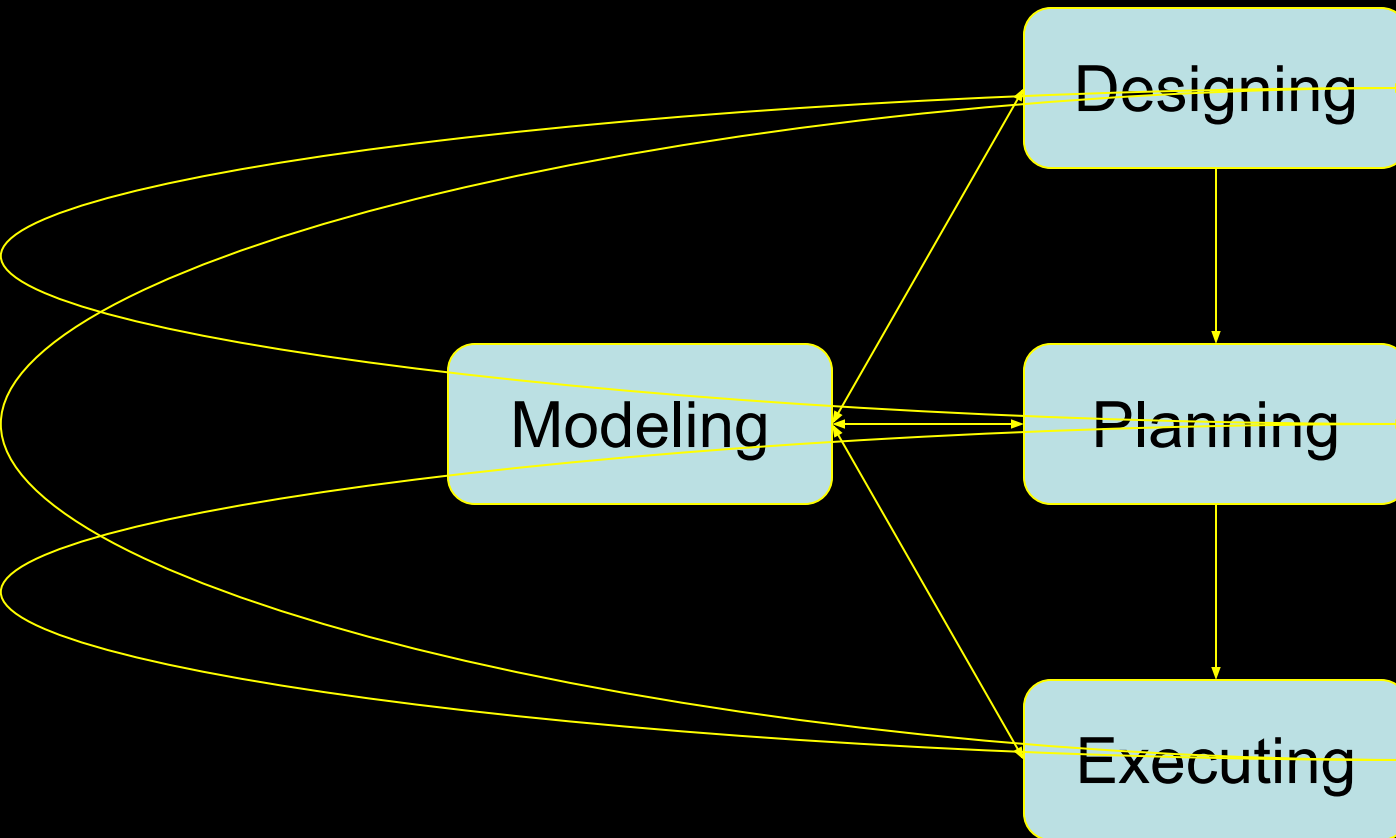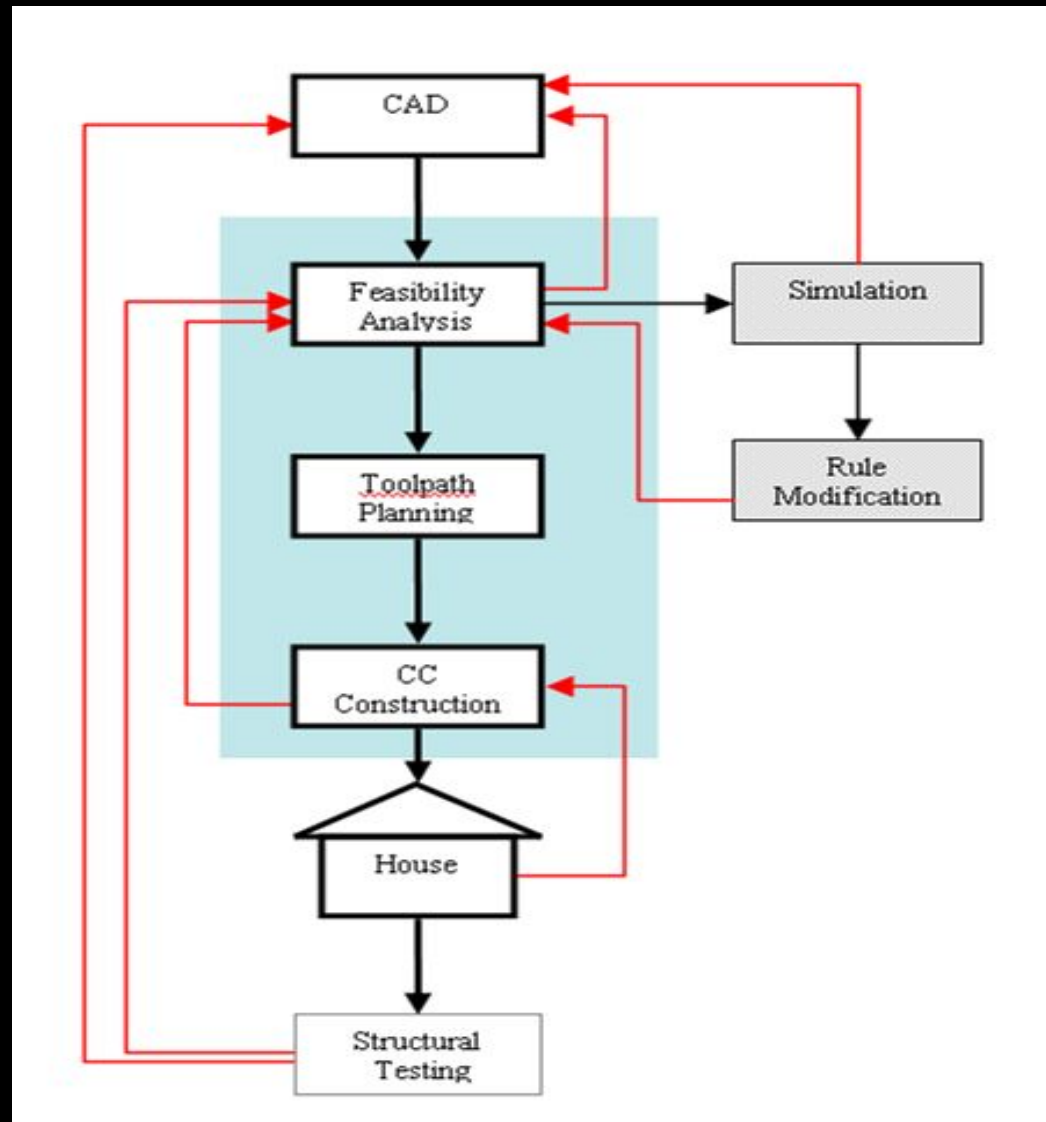# Information Technology Goals

- Perform the fundamental research and develop the software components for automating mega-scale fabrication
- Integrate components with each other and with robots from other thrusts
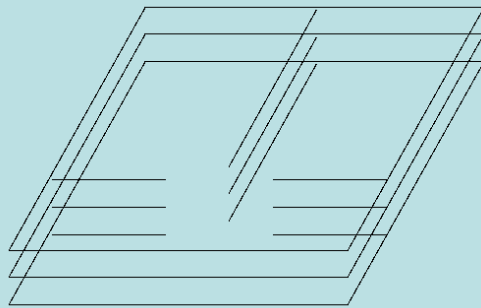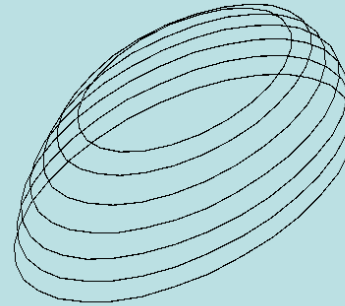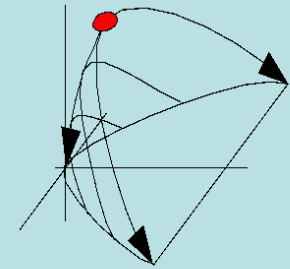
Four Classes of Software
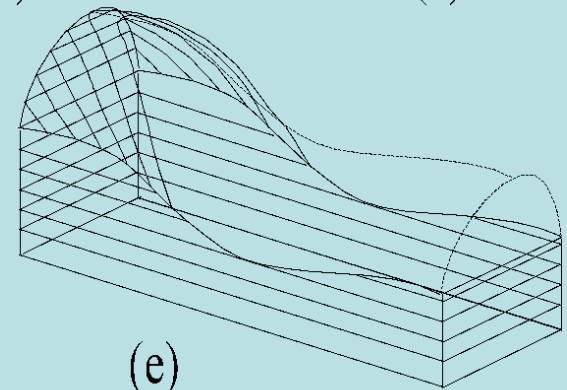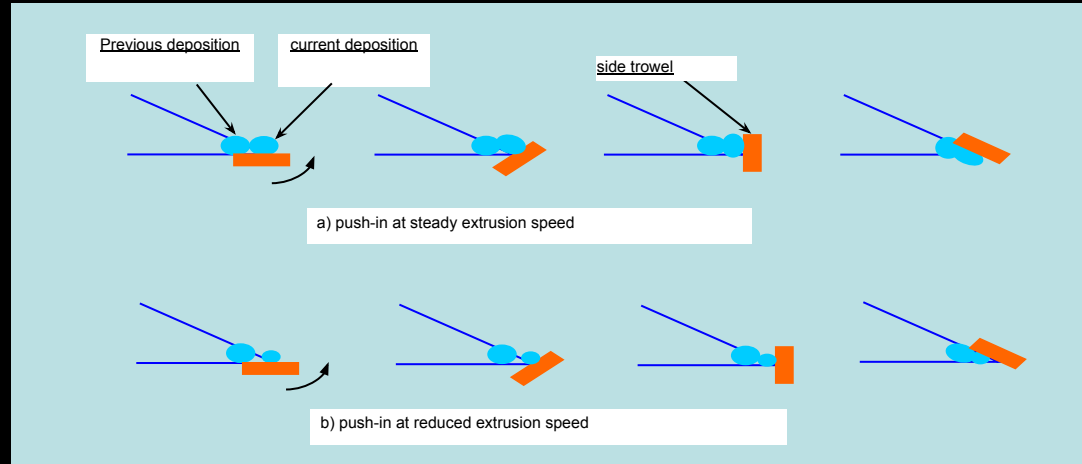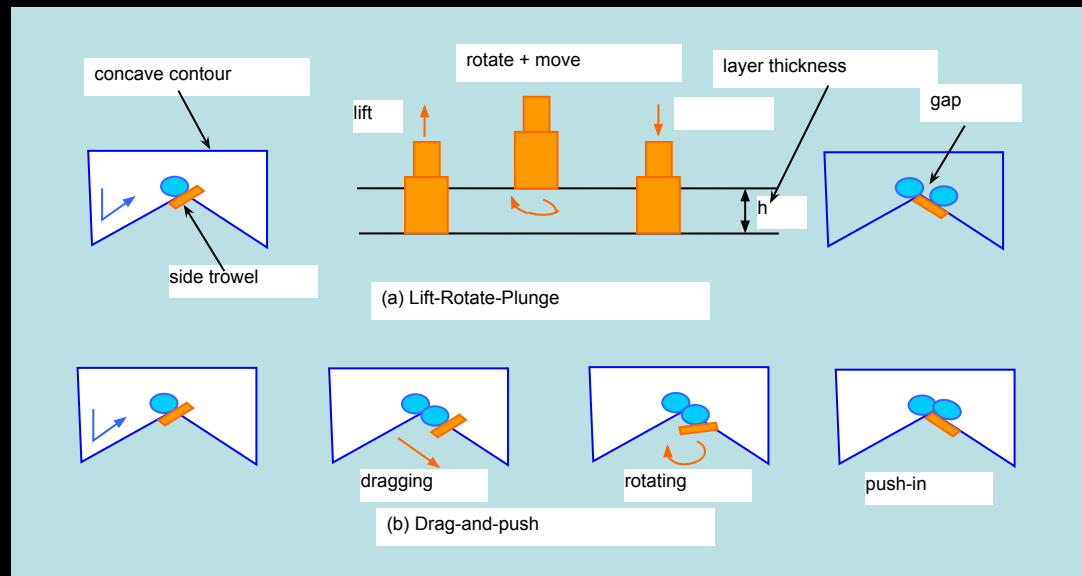
Research Plan

(a)

(b)

(c)

(d)

(e)

Trowel path planning

Trowel path planning and nozzle control around sharp convex corners

Previous deposition | current deposition | side trowel

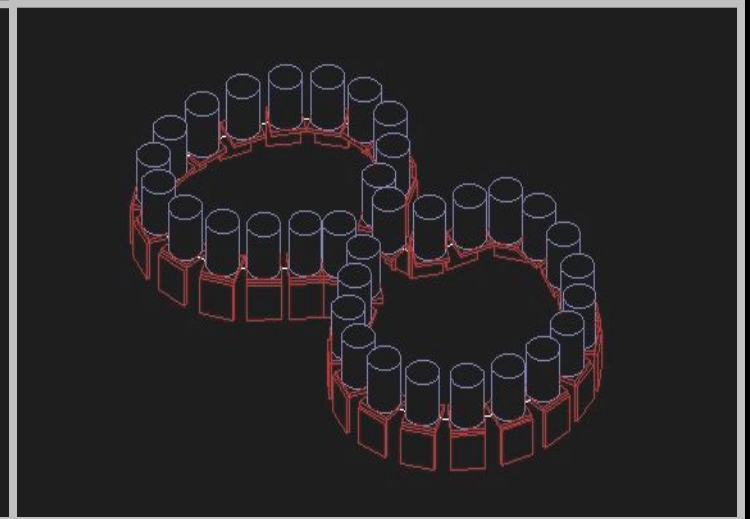a) push-in at steady extrusion speed

b) push-in at reduced extrusion speed

Trowel path planning and nozzle control around concave corners

concave contour

rotate + move | layer thickness | gap

lift

side trowel

h

(a) Lift-Rotate-Plunge
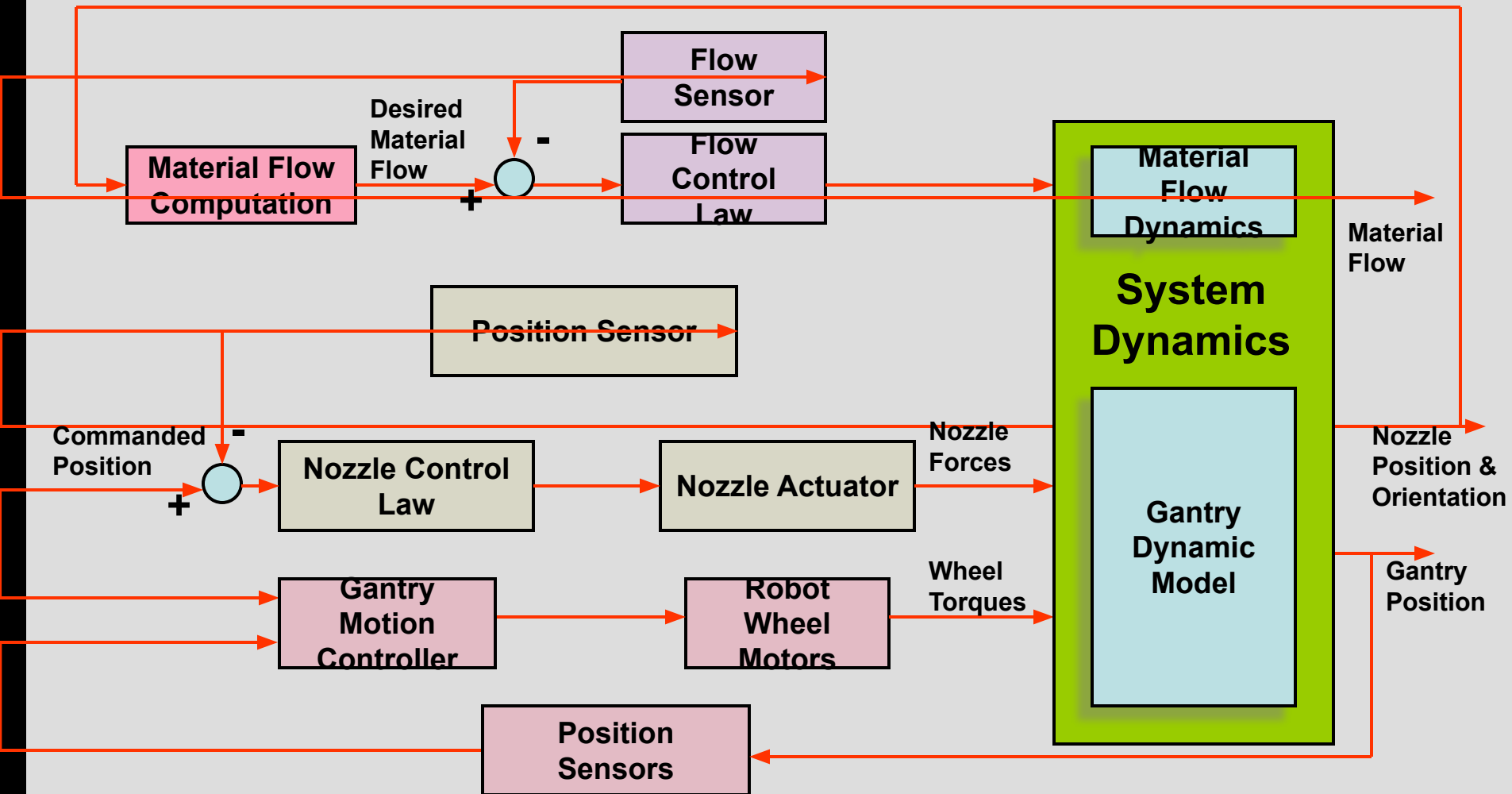
dragging | rotating | push-in
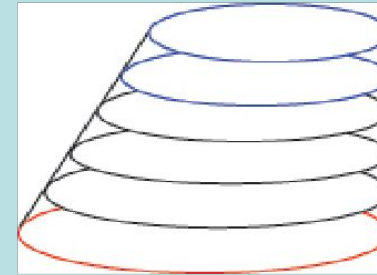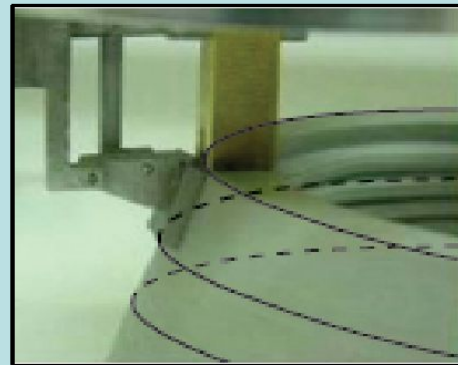
(b) Drag-and-push

Nozzle path planning
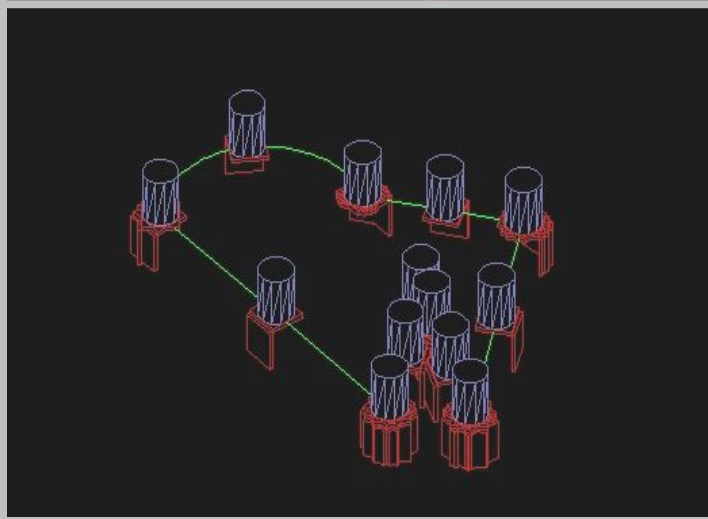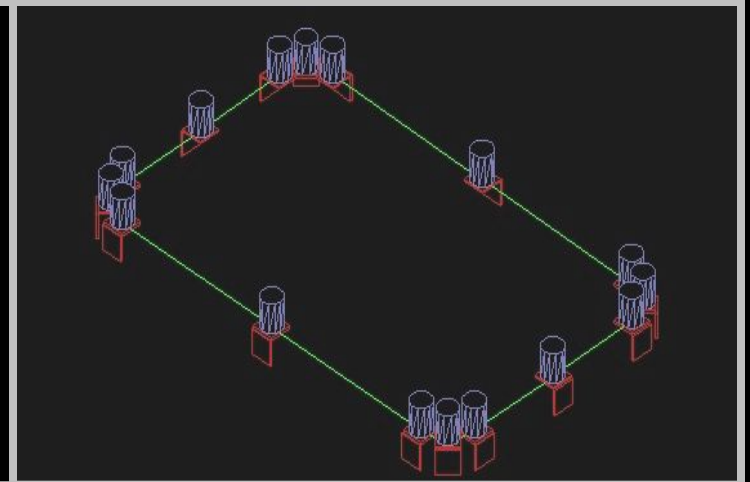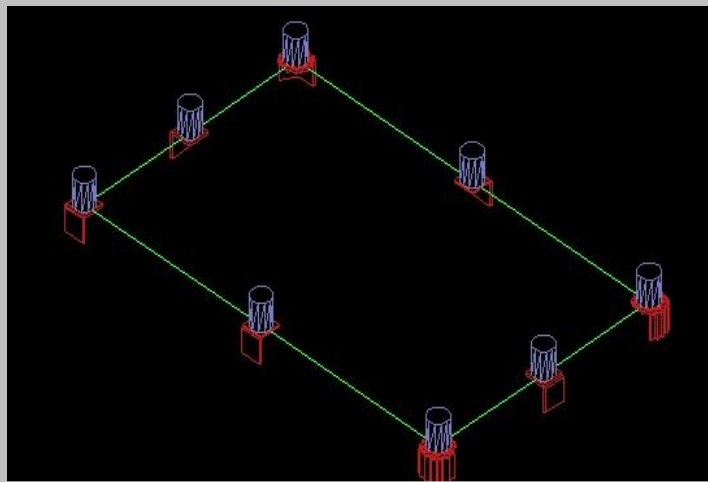
Dynamic Control

Visual inspection Contour Crafting

CAD Model

Visual Sensing
Single/Multiple Cameras

Texture Analysis

3D Reconstruction

Registration with CAD model

Quality Control

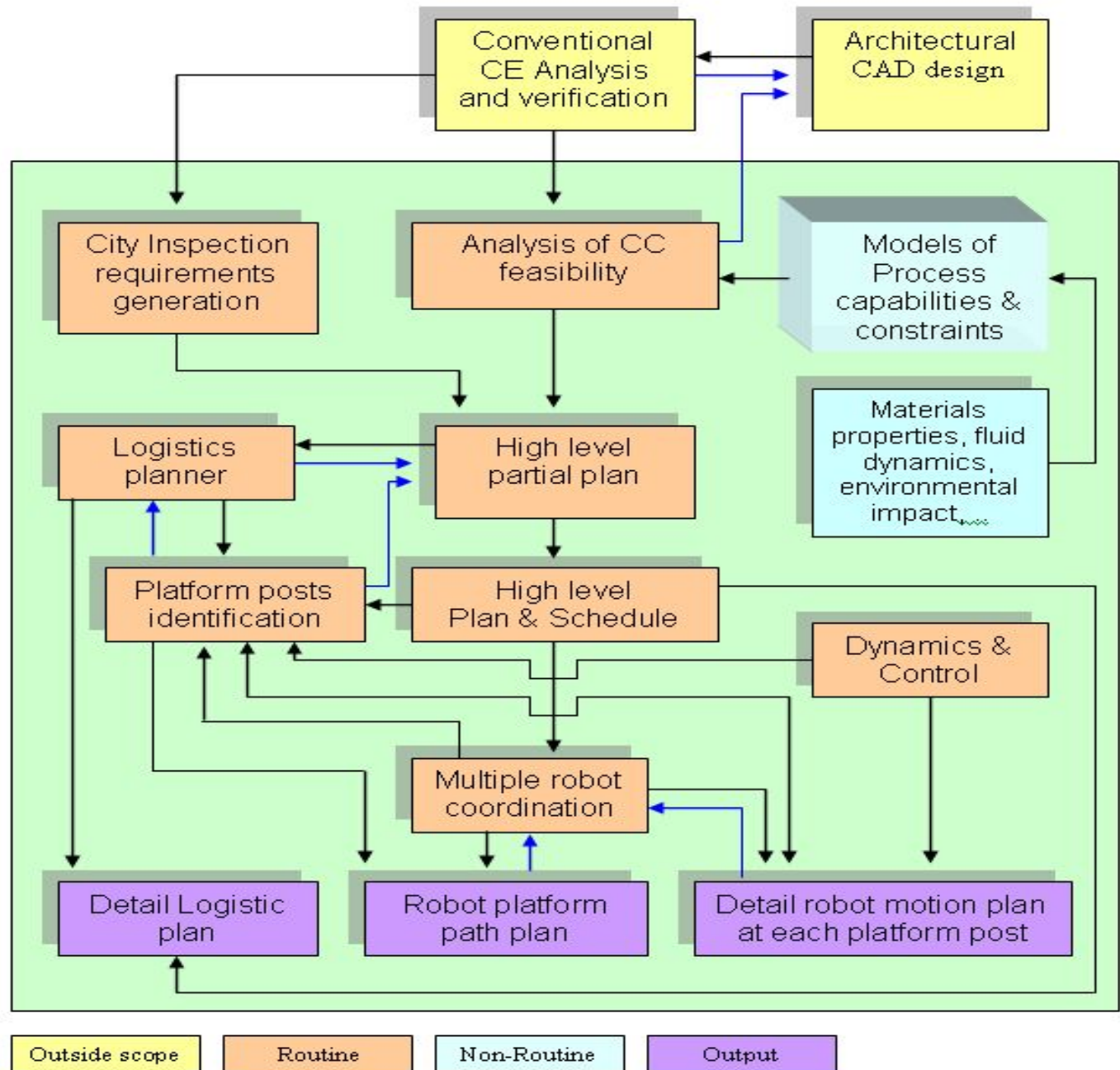Feedback to CC process Control

CC Process Summarization (Log)

The Integrated IT System

| Outside scope | Routine | Non-Routine | Output |

Interrelationships among the three research thrusts

Architectural Design

Integrated Software Systems

Logistics plan

Nozzle path plan

Assembly plans

Inspection plan

Visual Data

Modular Components & Assembly

Robot Commands

CC Hardware

Hardware Feedback

Sensory Data

Supply Dispatch

Indexed Video Log

Performance Restrictions

Structure design & Performance Requirements

Extrudable Material & Fabrication

Predictive performance