Algorithmic Description of Technology

**HARD COPY DUE IN LECTURE FEBRUARY 23**

Algorithms are the cornerstones of computational technologies. Computers can do so many things because we can break down the solutions to many problems into a series of steps. These algorithms can then be written in the symbolic language of computer code and executed on the microprocessors all around us. Algorithms address a specific task and they list, in order, the steps required to accomplish that task. Your group’s technology may be defined by a particular task; it may be a tool that can be applied to many tasks; or it may be a collection of many algorithmic subtasks. Either way, these tasks are accomplished by following an algorithm. The algorithm may be entirely computational and digital, or it may be partly computational (involving human users and/or mechanical components). Even non-digital technologies follow algorithms, as do service providers, organizations, and technical practices. A library, for example, has specific algorithms for checking out, tracking, and recalling books.

What to do:

This is an INDIVIDUAL ASSIGNMENT, but you should discuss and develop your ideas with your group. Once again, the group can take either a “breadth” approach or a “depth” approach. In the breadth approach, each group member describes a distinct algorithm related to your chosen technology, e.g. (1) how a robot crosses the street safely or (2) how that same robot grabs a cup of coffee. In the depth approach, each group member focuses on a subroutine that contributes to a larger, more complex algorithm, e.g. (1) how a robot’s sensors capture information about the world and (2) how that information, once received, modifies the robot’s movement.

First, identify the task that your algorithm will describe. Next, break the task into a series of logical steps and depict these steps as a flowchart. Flowcharts are graphical representations of processes that “flow” down one of many possible paths. Many examples can be found on the web, and we suggest reading the Wikipedia article to familiarize yourself with the concept. Note: flowcharts usually use diamond shapes to show choices and rectangles to show the state of the system. Arrows show the “flow” from one state or decision to another.

Your flowchart should depict the logical flow of your chosen algorithm, including all possible branches and looping routines. You must label all boxes, shapes, and arrows. Once you are finished, write 150-words describing the function of the algorithm, the task it accomplishes, or the problem it solves. Turn in one copy in lecture next week, and bring a second copy to section for discussion.