

The “Living” Room: A Case Study in Artificial Intelligence, Collaborative Systems, and Language Understanding

by

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The autumn evening bloomed. Kate sat back down at her desk to work, but she wasn't quite ready to begin. She still wasn't used to living on campus. At Preview Day in May the Admissions Office had shown a video of the new dorms, but Kate's building hadn't been scheduled for completion until June and so none of the incoming students really knew what the rooms would be like when they sent in their housing contracts. The dorm brochure made it sound like the place was designed and built by the M.I.T. Artificial Intelligence Lab rather than a housing contractor.

“For over 50 years,” the brochure read, “computation has centered on machines and not people. Now, the future is upon us. Computation is human-centered and ubiquitous. It handles our goals and needs and helps us to do more while we actually do less.”

Why were they hyping these dorms so much, Kate had wondered at the time. It wasn't like the incoming freshmen had a lot of housing choices.

The brochure continued, “Our students no longer need to carry around their own computers and iPods. The configurable generic devices in their clothes can easily communicate with those embedded in the dorm environment. And,” the brochure promised, “students will be able to communicate naturally with their rooms, using speech and gestures that describe what they intend, and leave it to the computer to carry out their will.”

“Ah,” Kate mused, “if only the room would write my term papers.”

When Kate finally moved into the new dorm that fall, she hadn't expected to feel comfortable in a room that could converse with her. But it seemed so warm and friendly that Kate finally named the room “Alice” and began to chat with the room on a regular basis.

“I went to see DaVinci Code with Marty and Cosmo last night after we exhausted ourselves at ultimate Frisbee. Incidentally, Marty still has extra tickets for Disneyland.”

Kate sipped her tea and stared at her books. “It's too warm in here,” she complained.

“Kate, the room temperature is 74 degrees,” Alice responded. “You had a cold last month. Shouldn't we leave it as is? We don't really want you to catch a cold with that environmental science class field trip to the hospital coming up next week.”

“Don't mother me tonight!” Kate retorted.

Occasionally Kate appreciated having Alice act like a parent. She missed having her family around to cheer her on and help her stay on track. But tonight she was feeling cranky. “Just turn it down! You know its germs and not a slightly cool room that causes colds. As long as you aren't contagious, I'll be just fine with a cool room!”

Alice chuckled. “OK, you called my bluff. The university’s AC standard for energy conservation is 72. Do you want to go with that, or override and set it to 68?”

“OK, OK, OK, I’ll try 72. But if I’m still too warm after 15 minutes, make it lower.”

Kate had to admit that the conservation measures were in place for a good reason and generally she wanted to support the initiative, but tonight she just wanted to be cool enough to be motivated to crack the books. And she did not want to be excluded from the field trip. After a few moments the air conditioning clicked on and the room began to cool down. Alice made a note not to use the cool-temperature/cold line again, at least for a while. After 15 minutes, Kate was at work and apparently comfortable with the room at 72 degrees, so Alice left the thermostat setting there.

A few days later Kate plopped onto her bed. “I’m bored,” she grumbled. “And tomorrow’s going to be another boring day. I hate being stuck in the dorm over the weekend.”

“Kate? Kate?” Kate heard Alice’s voice calling her name. She still wasn’t quite comfortable with the room keeping track of her. “Marty has extra tickets to Disneyland. You could ride down there with her and have some fun. Or maybe you could play Frisbee and see another movie with Marty and Cosmo.”

Questions

1. What would cause Kate to consider the room warm and friendly?
2. What role does the word “incidentally” play in the conversation Kate has with Alice?
3. What does “incidentally” reference— a break in the previous conversation or the sentence it is in?
4. When Kate complains about the temperature in the room, the room interprets the complaint as a request to adjust the thermostat setting on the air conditioning unit. What knowledge and reasoning are needed for the room to respond appropriately to Kate’s declaration?
5. Kate and Alice engage in a brief argument about the room temperature. What does Alice need to know about the structure of arguments to be able to respond appropriately?
6. List the associations Alice needs to make in order to suggest a trip to Disneyland or Frisbee and the movies.
7. What is boredom? How does it affect a person’s behavior? What causes it? What cures it?
8. Alice suggests that Kate can ride “down” to Disneyland with Marty. By Alice’s use of the word down, what can you infer about the location of Kate’s dorm relative to Disneyland? What can you infer from the fact that Alice suggests they drive there?
9. How likely is it that Kate is athletic? What would a computer need to know to draw the same conclusion?
10. List some real world examples of collaborative systems you have read or heard about.
11. Describe at least one collaborative system to which you would like to have access.

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