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**THURSDAY**

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# GARDEN

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GREEN THUMB ♦ DO-IT-YOURSELF



# Tale-Garden



Tip-toeing through the tulips  
is bit different in on line garden



# Tip-toeing through the tulips is bit different in on-line garden

BY CATHRYN DOMROSE  
Special to the Mercury News

**I**n a University of Southern California classroom, surrounded by desks and computers, a six-foot circle of greenery thrives.

Amid the chatter of students and the hum of monitors, a robot arm whizzes around the circle, tending flax, tiny tomatoes, peppers and petunias. A revolving grow-lamp provides warmth and light. A digital camera installed in the robot arm constantly snaps pictures of blooming flowers and pale green growth.

Welcome to the Tele-Garden — where more than 3,000 computer gardeners from around the world plant, water and watch seeds grow, all via the Internet.

The scientists and artists who created the garden and put it on-line see it as part interactive fun, part social experiment and part Internet art project that juxtaposes the ancient mysteries of cultivation with the modern miracles of computer engineering and robotics.

"This is organic as opposed to everything else on the Web, which is cold and mechanical," says Ken Goldberg, the robotics scientist who headed the six-member team that designed and built the Tele-Garden at the USC campus in Los Angeles.

Here is how it works:

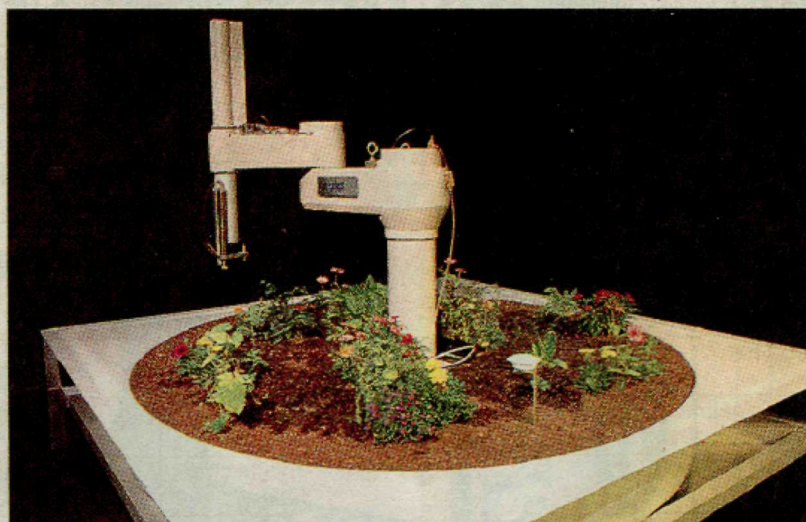
■ With a few clicks of a mouse, any registered member of the Tele-Garden can plant up to three seeds. One week the seeds might be marigolds. Another week, eggplants.

■ The member chooses a planting spot on a computer image of the garden. The robot drills a hole there. Then it sucks up a seed from a shallow cup at the edge of the garden, drops it into the hole and covers it.

■ The whole process takes seconds. The robot arm moves so quickly that Goldberg's team had to put chicken wire around the garden so curiosity seekers didn't get their heads bashed.

What happens in the next few weeks is up to each planter, as well as the whim of the seeds and soil. A few people plant a seed, then never return. Some sign on regularly, instructing the robot to spray water over their square of soil.

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USC NEWS — SPECIAL TO THE MERCURY NEWS

A robotic arm tends to even the little things in academia's garden a la Internet.



# How your on-line garden grows, megabyte at a time

## ■ ROBOT

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The gardeners monitor their seed's progress by way of the photographic images taken by the robot's camera. They can move the arm up and down and around the circle.

Some have accidentally crushed their tiny plants with the robot's arm. Others have deliberately crushed their own seedlings or those of others. Some have planted seeds on top of someone else's seed. Sometimes the robot arm breaks down or goes off-line and the garden's creators have to plant and water by hand. Some plants die. Others never come up.

"It's not exactly a perfect system, but we didn't want that," says Rosemary Morris, the South-

ern California architect who designed and landscaped the organic part of the garden. "You set the stage and provide the tools and the community makes the project."

Morris deliberately limited information about the plants to what gardeners might find on a seed package. She wanted them to help each other through an Internet chat line called "Village Square." On-line comments range from the usual Internet pick-up lines — "You have a nice plant. I hope you're a girl" — to awe at their endeavors — "I think my seedling is up. Is it? Is it that twisty naked-looking thing?"

With some 500 plants now crammed into the circle, some members are concerned about the garden's future. Goldberg was encouraged by a recent message: "Listen everybody, we're running out of space. Let's team up and share plants."

Goldberg is on leave from USC and working in UC-Berkeley's industrial engineering department

this year. In an earlier Internet project, he and his team buried 25 objects in a sandbox. Computer users commanded a robot to blow away the sand so they could see the objects — a mirror, a watch, an ax — used in the Jules Verne novel, "Journey to the Center of the Earth." No one guessed the connection, but Internet aficionados put the robot to work more than 2 million times.

Last August, Goldberg invited six artist friends to his house. They talked about creating another on-line event that would make computer users stop and take notice. Something they couldn't click off and walk away from.

Joseph Santarromana, a video artist and lecturer at UC-Irvine and the Tele-garden's co-director, suggested a garden. "He thought it would be really nice for somebody to watch a plant grow over the Net," Morris says.

A San Jose company, Adept Technology, donated the robot arm for the project. The USC School of Engineering gave mon-

ey to get it started. By the third week in July, 850 green index-fingers were signed up, clicking and planting.

"There's this physical interaction," Goldberg says. "You feel like you're doing something in the real world."

Not that computer gardening will ever or should ever replace real gardening, he adds. That would defeat the whole purpose of the project.

"It's a way of raising questions," says the man who putters in real soil at his San Francisco home, after days of working out lines of complicated mathematical formulas. "A way of making people think about the fact that they have a body and they have to eat lunch."

## IF YOU'RE INTERESTED

If you're interested: You can check out the Tele-Garden on the World Wide Web by signing on to: <http://www.usc.edu/dept/garden/>

*Cathryn Domrose is a free-lance writer in San Francisco.*



**Goldberg**