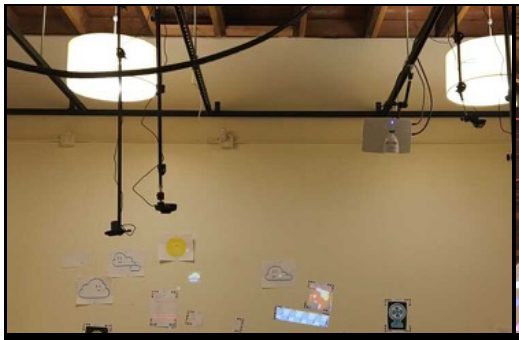
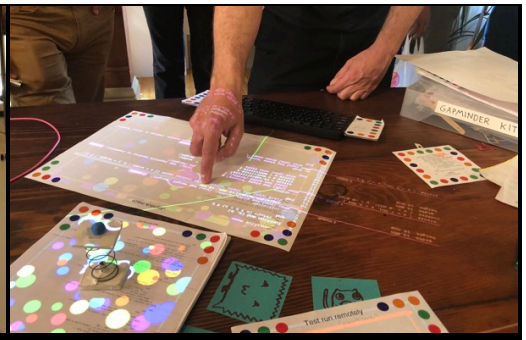
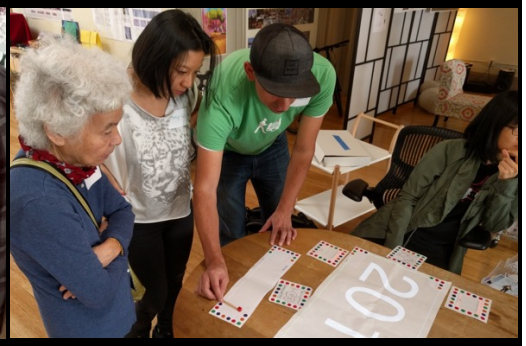


Ceiling-mounted hardware...

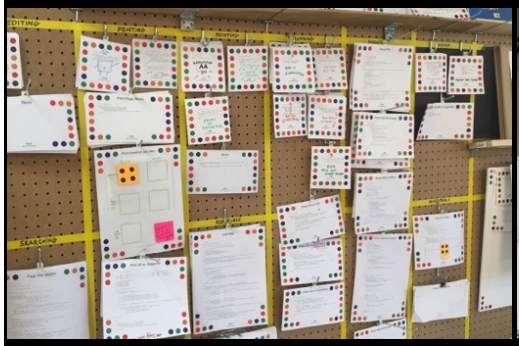


... recognizes and illuminates physical objects.

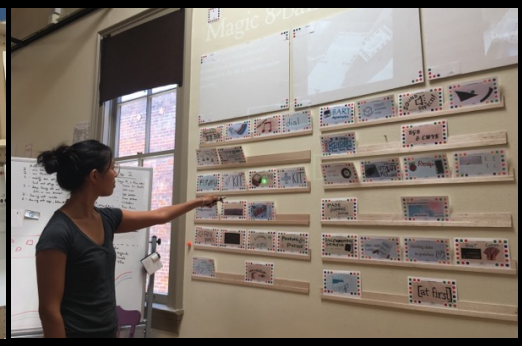
Communal authoring



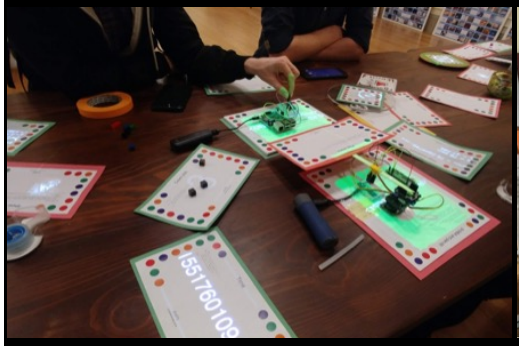
Learning through immersion



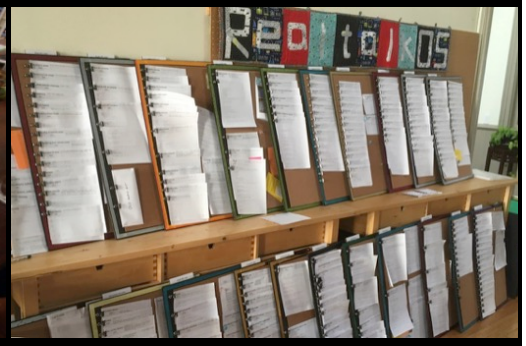
Dynamic tool wall



Exploring projects in the gallery



Integrating with electronics



Realtalk OS implementation

Realtalk

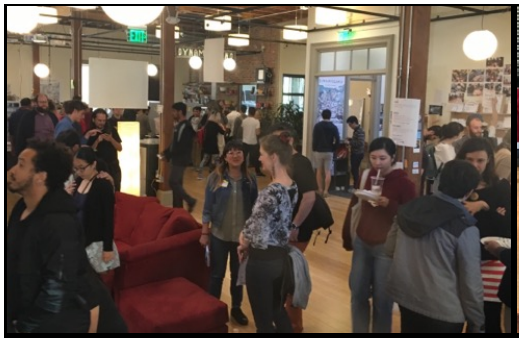
An operating system for communal computing

In Realtalk, cameras in the ceiling recognize ordinary physical objects — index cards, books, board game pieces, 3D-printed models — and projectors illuminate them with visualizations. In this way, the entire building becomes the computer. Groups of people work together in real space, with everyone getting their hands on tangible computational objects on the table, while immersed in data on the walls.

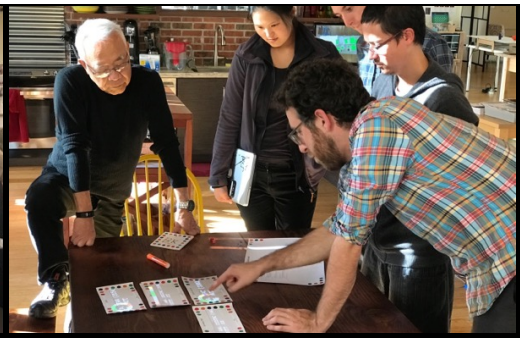
Computational activities and tools are created by the people themselves. Programs are themselves physical objects, and thereby support a variety of authoring styles, from writing code, to spatially arranging objects, to drawing domain-specific hand-written notations. People learn to program by immersion — programs are everywhere, and everyone works on programs out in the open, where others can observe and join in.

Computational objects communicate by publishing readable information into the space — *"I am on the kitchen table", "I am pointing at a map"* — which any other object can notice and react to. The simplicity and visibility of this model makes it possible for people to understand what is happening, and to take anything apart to extend it. Even the operating system itself is a compact and accessible set of physical objects, which can be live-edited by anyone at any time. The long-term goal is for every community to design and construct their own operating systems for their own needs.

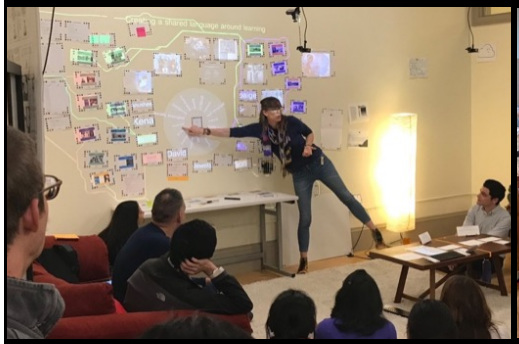
At Dynamicland, thousands of people used Realtalk to build hundreds of projects, covering topics from statistics to digital synthesis to poetry. Realtalk's networking capabilities allow projects to be physically carried between sites, or replicated remotely via the internet, laying the groundwork for a growing network of communal computing around the world.



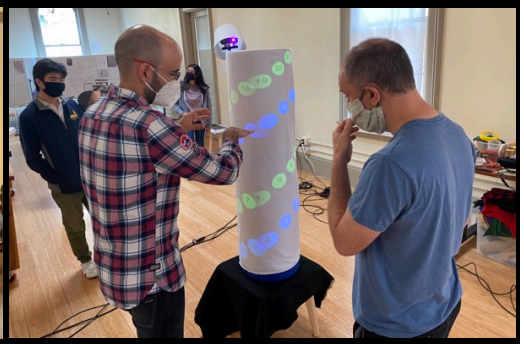
Community events



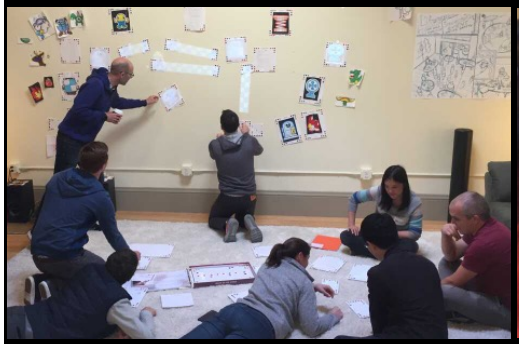
Model-driven discussions



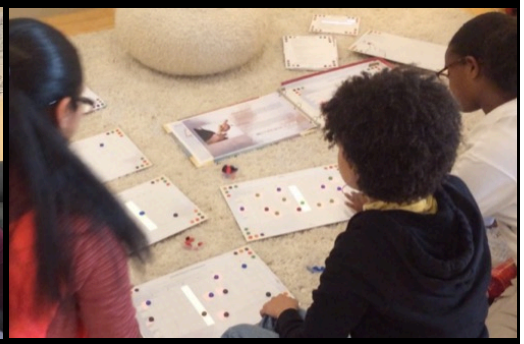
Dynamic presentations



Human-scale dynamic models



Communal authoring



Dynamic “board game” books

Multi-week residencies

Exploratory workshops

Dynamicland

A community-driven communal computing space

We founded the Dynamicland community space in downtown Oakland, California, to establish our vision of communal computing in direct collaboration with a community of practice. With walls and tables illuminated by Realtalk’s computational light, hundreds of people could simultaneously work together to create and explore tangible dynamic models. Between 2017 and 2020, we hosted and taught thousands of visitors, from public community events to multi-week residencies to intensive workshops to class field trips.

We assembled the Dynamicland core community from dozens of local artists, engineers, educators, and community organizers who learned Realtalk from us, taught one another, and filled the space with a library of tangible models of topics they were passionate about.

Dynamicland was designed to give the community total agency within the system. A tool wall collected useful apparatus for manipulating and editing dynamic models, and community members came to know these tools as intimately as carpenters in a wood shop. A tutorial gallery held dynamic books teaching different aspects of the system — graphics, sound, spatial relationships — and it was an everyday occurrence for community members to modify the operating system itself, which lived on a set of illuminated whiteboards. In a dynamic theater, presentations took place with dynamic timelines spanning the room, and audience members physically placing living programs directly into the presentation.

On a given day, you might find a community member building a prismatic light simulation on one table, while a group nearby explored the harmonic relationships between different scales of music. A dynamic graph of social and economic data was connected to a dynamic map, which connected to a live satellite feed tracking wildfire progression and predicting air quality. Community creations and connections such as these happened constantly.