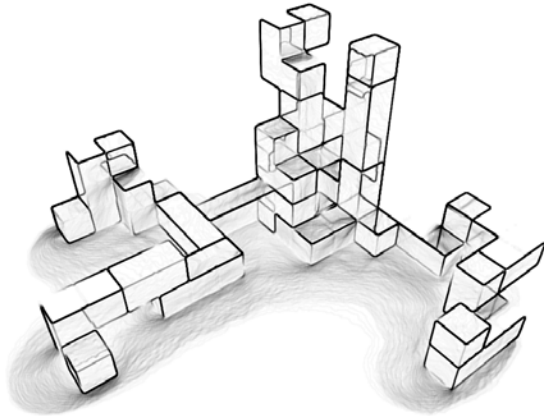


Constructed Narratives Electronic Construction Kit

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ABSTRACT



This paper presents a brief overview of the Constructed Narratives Electronic Construction Kit prototype developed with funding from the NSF Creative IT program Award #0715304: “Designing Critical Creative Technologies to Support Collaboration in Public Spaces.

Categories and Subject Descriptors

H.5.2 Information Interfaces and Presentation, J.5 Arts and Humanities

General Terms

Algorithms, Design, Experimentation, Human Factors.

Keywords

Tangible social Interface, Computer Supported Collaborative Play, Public Space Interfaces, 802.15.4 Networks, Collaborative Design.

1. INTRODUCTION

Constructed Narratives is a collaborative game where players construct a world in which they provide the dynamic contextual materials that give form to the world that they are constructing. It

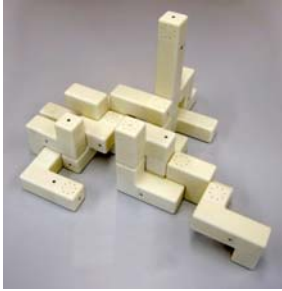
has been designed as a collaborative game to facilitate discourse, exchange of ideas and negotiation of design intentions and choices between collaborating participants. Designed for adults and older teenagers, the game presents an open-ended construction metaphor to elicit childlike curiosity to explore through collaboration and negotiation. Constructed Narratives has been likened to a combination between Scrabble™ and the Rubik Cube™, a physical magnetic poetry or Exquisite Corpse. As both a mechanical puzzle and a language game, Constructed Narratives supports collaboration and social networking with other players as a strategic method of play.

2. TANGIBLE SOCIAL INTERFACE

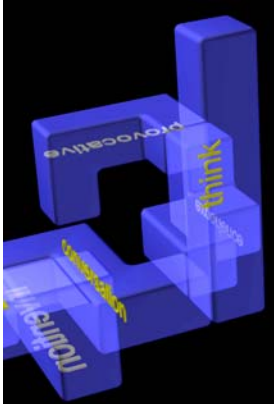
Constructed Narratives is a tangible electronic construction kit of pentomino shaped blocks (complex shapes assembled from five cubes). A three dimensional virtual replication of the physical construction is projected into the game play area in real time as players build with the physical blocks. The virtual replication of the physical construction includes a textual landscape of words that are printed on the virtual blocks. The virtual replication of the physical structure is presented on a screen in the game play arena. These words are generated from a search algorithm that combines attributes of the block shape, how the block is connected and the identification of the player who claims ownership of the block. Block ownership is determined by use of the IDwand. That indicates the players’ intention to own or annotate the block with metadata that is stored in the system database. Designed for experiments in social networking and learning in physical environments, the tangible social interface (TSI) is based on the premises of the tangible user interface (TUI) – physical objects embedded with hardware sensors for responsive input and output when manipulated. The tangible social interface (TSI) gives unique output based on the manipulation technique and profile information from the participant. This enables each participant to see the impact of their choices on a collaborative task-driven construction / design activity.

3. APPLICATION AND ENGINEERING GOALS AND ACHIEVEMENTS

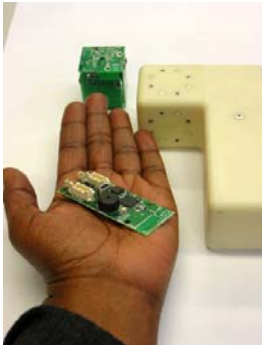
The Constructed Narratives Electronic Construction Kit has been designed with the following goals. Develop a tangible social interface game that serves as a facilitator for discourse, exchange and negotiation of ideas and decision making between collaborating players. Develop an intuitive physical interface that encourages players to explore and build. Develop a tangible interface that requires a minimal of external devices or processes (e.g. vision and sensor systems) for tracking player’s interactions.



Constructed Narratives Prototype



Visualization Application



Main 802.15.4 circuit.

Develop a dynamic system architecture that supports multiple modes and representations of the player's interactions.

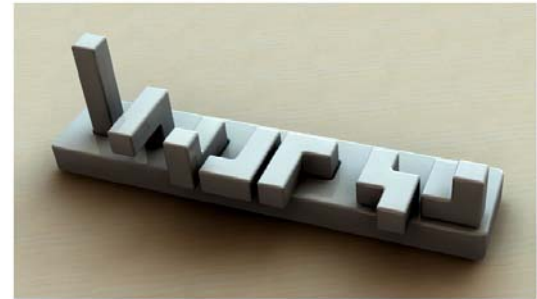
The proprietary hardware and software architecture for the construction kit are based on a 802.15.4 Zigbee enabled wireless network platform that supports mesh networks. The current prototype consists of fourteen prototyped blocks. An integrated hardware / software power consumption self-monitoring system has been designed for long lasting battery power. The blocks automatically re-charge when placed in a specially designed block storage bin. The block design and connection system is based on a "gender neutral" connection scheme that provides ultimate flexibility in construction design. The host server application is built on the Java™ Agent Kernel platform. The visualization application is developed in Java3D.

There is an added challenge developing technology under the umbrella of creative practices, as institutional structures are rarely equipped to sustain research efforts – both financially and operationally. With this noted, the Constructed Narratives Electronic Construction kit, in its entirety and components, has been demonstrated and/or exhibited at 2003 Interact, Zurich, Switzerland 2004

International Society of Electronic Arts Conference, Helsinki, Finland; 2008 ACM Computer Human Interaction Conference, Florence, Italy; and the 2008 ACM Multimedia conference in Vancouver, Canada. Development of selected components of the system, both technical and theoretical will continue as research on methods and development techniques and application evaluation yield fresh insights to the design of tangible social interfaces. This includes continued research on the integration of theories of communication into pattern search algorithms form factor design and materials research for tangibles and data visualization.



IDWand for dynamically tagging tangible devices



Battery charge base game piece storage system.

4. ACKNOWLEDGMENTS

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