Puzzle Space: A Distributed Tangible Puzzle for Long Distance Couples
#tangible user interfaces #long distance relationships #collaboration over distance
Rui Pan, Carman Neustaedter, Alissa N. Antle and Brendan Matkin{ruip, carman, aantle, bmatkin@sfu.ca}
School of Interactive Arts and Technology, Simon Fraser University

INTRODUCTION
Long-Distance Relationships (LDRs) involve distance separated couple or partners. Having shared leisure activities is an important part of long distance relationships. Our research explores how we can connect long distance couples over distance through a distributed playful activity. We designed Puzzle Space, a distributed puzzle to allow LDRs to play puzzle synchronously and remotely.

PLAYFUL INTERACTION
Puzzle Space allows two users to play jigsaw puzzles together over distance. The tabletop box contains puzzle pieces on top of it at each location. One player can only manipulate his/her own physical puzzle pieces. A computer display placed next to the boxes shows the digital puzzle pieces from both the player and his/her partner. As a player moves the physical pieces, the corresponding digital piece will move on the screen synchronously. We also provide a face-to-face video chatting channel while playing.

Mapping Between Physical & Digital Content
We used a laser cutter to make 20 jigsaw puzzle pieces out of a A4-size fiberboard. We placed a fiducial marker on the back of each physical puzzle piece. The fiducial marker is for mapping between digital and physical form of the piece. The digital pieces have the same jigsaw pattern and image content as the physical pieces.

Contribution
The main contribution of Puzzle Space is identifying requirements and design rationale for an exemplar of a distributed form of playful interaction which could be used to study its impact on LDRs.