



# Designing Izbushka: Investigating Interactions in Context Zero Environments

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## ABSTRACT

*Designing computer interfaces and other technologies that interact with users in adaptive ways that attempt to emulate their natural styles of learning is difficult. As technology has become main stream in our daily interactions, adaptive interfaces are key in helping users in many situations. In this article we discuss the preliminary investigation with the intelligent agent named Izbushka and how it can be used to collect various data from human users in an attempt to understand how they learn while interacting with technology. Izbushka as a tool will help to generate new ways of understanding and conceptualizing interaction by presenting users with a "zero-context" environment. Izbushka presents users with a unique interface in an attempt to study user interactions that lack traditional metaphors or ontological grounding typical in many computer interfaces. The Izbushka agent is our first step towards filtering out preconceived metaphorical ideas in order to generate new understanding of human computer interaction.*

*Keywords: adaptive agents; coupling interface; interaction; Izbushka; zero-context*

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## INTRODUCTION

The evolution of technology and its integration into many aspects of society has created new socially constructed realities, in of itself creating new social situations and forms of communication, interaction and interface design. As both society and technology have changed over the years our methods and structures of communication, learning, interaction and collaboration has too been impacted and subsequently evolved from such change. The society of the information age has been infused into our normal daily

lives in a way that has fundamentally altered our modes of thinking about such technology and interaction itself. With these changes it is important to understand how we have been impacted and how these new mediums for interaction are understood and conceptualized as our perceptions have changed. Many virtual and artificial spaces create environments that bypass the normal physical boundaries associated with real life and real time face to face interaction. As part of the synergistic changes brought on by technology, our models, methods and abilities to interact with computers should

also change. The design and implementation of the human element in human-computer interaction should be thought of as a variable itself and as an artifact of our culture that dynamically adjusts with changes in our technologies (Trajkovski, 2006).

Many aspects of information technology such as the internet, instant messaging, email, digital media, e-commerce and distance learning, are common place and used much more now than in years past. We now have access to a multitude of information presented to us in a plethora of ways. Society and many of its functions have become increasingly dependent of these mediums for information and communication. The internet alone has been growing at exponential rates with new links and data being updated and added constantly. We are surrounded by information; data is thrust at us in many forms often causing us to become overloaded or confused. Users can typically become frustrated and anxious especially when using many standard technologies we often take for granted such as word processors, email and while surfing the net (Ceaparu, 2002). Given all of this data, even with the best programs, users want their information presented in a way that is understandable and structured. While working with vast amounts of information they will want to be able to filter, select and restructure it, with least possible effort (Shneiderman, 2005). Many of the interfaces for applications and interactive environments are counter intuitive thus adding to user frustration and sharpening the learning curve for understanding the application functionality and the information that it is trying to provide. How can we then create an interface that a user can utilize and interact with, in a way that will closely relate to his or her natural learning style, so that it can be used in the most efficient and effective way? This question takes us to the main of the purpose of our investigation as we try to discover new ways to help solve many interface and learning problems between computer technology and human users.

Through the use and investigation of intelligent agents we can study these human

and computer interactions in ways that are new and unconventional. Agents can be used to study various emergent behaviors that occur when human users interact with technology. These behaviors and interaction patterns are what shape and drive many interface designs in computer technology. Only by changing our perception and developing new ideas can we truly understand the best methods in which humans and machines learn and interact together. It is not in our best interest to create interfaces or rely only on our current methodologies and metaphorical constructs for current computer environments and software; we need to truly have an understanding of human perception in these contexts in order to develop the best ways of interaction. Through the interaction with computers and other technology, the interaction process has generally "been structured through metaphors drawn from physical spaces...and through certain assumptions about the user derived from pre-existing, physical relationships" (Trajkovski, 2006). Some preconceived metaphors commonly shared between users of internet and other technology that are grounded in the real physical world include: Online shopping, Shopping carts, virtual classrooms, Chat rooms, Desktops, Multi-user dungeons, e-books, email etc. Many computer related metaphors are drawn from real objects or real spaces or interactions. Our investigations seek to find new and different ways to interact in these environments in ways that are not grounded in such preconceived metaphors.

For our investigation into these concepts we developed an environment-agent named Izbushka that will be used to collect data and study emergent interactions between human and non-human agents. The results from these interactions can be used to understand ways in which people and machines "learn", interact, form multi-agent societies and form metaphors which are used to make sense of, and characterize computer agency and computer interaction" (Trajkovski, 2006). Izbushka has been created to help us understand interaction "as a simultaneous cognitive, social and cultural event" while studying "emergent forms of learning, com-

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