

# mediPuppet: An Interactive Comforting Companion for Children While Visiting a Doctor

Szu-Chia Lu, Andy Wu, Ellen Yi-Luen Do

GVU Center

Georgia Institute of Technology

Atlanta, Georgia 30332

{ sj.today, andywu, ellendo }@gatech.edu

## ABSTRACT

Young children often feel anxious when visiting the doctors. This paper presents mediPuppet, an interactive companion with an exploratory procedure map designed to help children feel more relaxed and comfortable during their medical procedure. The ultimate goal of this study is to transform an intimidating stressful situation into a joyful exploring game for children during hospital visits.

## Author Keywords

Children, game, interactive puppet, pediatric patient, health.

## ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## General Terms

Design.

## INTRODUCTION

A regular medical exam can be an unpleasant event for young children and their parents. A hospital visit can quickly become a battle before, during or even after the exam. The reason why young children experience this anxiety is the fear of the unknown, which is often more frightening than the reality. A friendly comforting companion and a well-designed procedure informing system can help to put the child's mind at ease, and their parents' as well. A comforting object can provide further relief to help a child remain calm during the physical exams. An explanation before the procedure, including what to expect from the doctor or nurse, would be beneficial in helping a child to be mentally prepared for the upcoming exam. It also provides the parents information of how to assist in the next exam procedure for their child. Therefore, we built a prototype interactive comforting puppet to support emotional bonds and provide responsive interactions for children. We then conducted a user study to observe the interaction between young children and this interactive companion.

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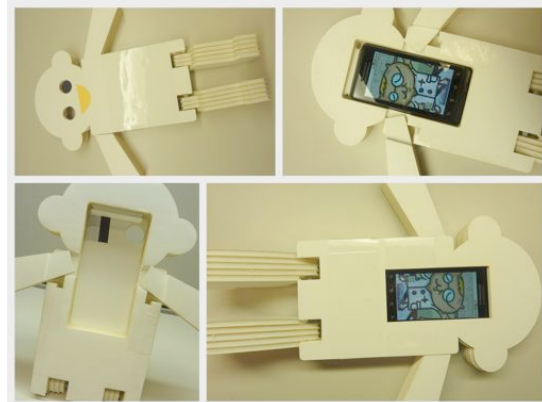
## BACKGROUND

The Hays Medical Center in Kansas [1] gives "a Josh and Friends kit", which includes a plush puppy "Josh" and a book, called "I'll Be OK". The Emergency Department in Emerson Hospital in Massachusetts [2] distributed the Coping Kit with books and toys that varies by age group and color-coded by gender. However, these comforting kits cannot produce real-time responsive support for the children and the young patients might get bored easily.

The other therapeutic aspect called The Animal-Assisted Therapy (AAT) advocates the interaction between the young children and their pets can provide strong emotional bonds, promote the sense of security to the child pet owner. It can ease the anxiety of the young patients and quicken the medical procedure as well [3]. However, not all pediatric hospitals or parents can afford to have an animal companion for each child during their hospital visit.

## PROTOTYPE DESIGN

The prototype of mediPuppet was made of foam boards with an Android phone embedded (Figure 1). The size and weight of this prototype is designed for young children to hold or walk around with them. The puppet has no small parts that could fall apart or cause choking hazard. An Android phone embedded provides a quick programmable platform to support interaction design so that a child can interact with the environment through the puppet.



**Figure 1. One of mediPuppet's eyes is a hidden Android phone camera. The phone's touch screen is viewable from the back of mediPuppet.**

## PILOT STUDY

We conducted a usability study to learn more about the interaction between the child and the puppet. Our young participants whose ages range from 3-5 years old who were paired interviewed with their parents. The experiments were in a pseudo hospital environment and took around 90 minutes in total for the three experiment sessions.

1) **Pre-observation interview** (30 minutes) Parents were asked to answer open-ended questions about the child's reaction and previous experience of visiting a doctor.

2) **Field Observation** (45 minutes) The child was given the puppet to play with, to name it, and to decorate it with one of the origami dresses (Figure 2). In the *examination phase*, the child explored the medical exam steps by scanning the QR code on the procedure game map (Figure 3) with mediPuppet's hidden camera. The whole session was recorded for data analysis.



Figure 2. Origami dresses used to decorate the mediPuppet



Figure 3. Procedure game map visualize the medical examination procedure and to support the interaction with mediPuppet for learning and exploration.

3) **Post-observation interview** (15 minutes). We asked the child to talk about his or her feeling and experiences from playing with the puppet during the pseudo medical exam.

## PRELIMINARY RESULTS AND DISCUSSION

All parent participants we interviewed indicated that their child was able to understand and accept the concept why they have to see a doctor. However, unexpected or sudden exam actions from a doctor would still scare the child and bring about all the tears and screams. Both the children and the parents preferred to be informed beforehand. The field observation found that the children enjoyed naming and decorating the mediPuppet. Through engagement in the activity, they formed emotional bonds with the puppet. They called the puppet with names from their real life experience (e.g., naming it Baby because the mother is

expecting). The children considered the puppet as a real person and posed the puppet into different poses to help it "see better" or "feel comfortable." All children in the post-test interview felt emotionally attached to the puppet and expressed the desire to carry the puppet with them next time when visiting a doctor.

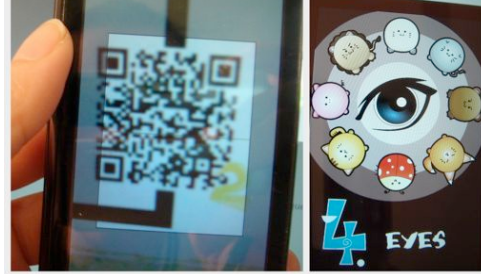


Figure 4. The QR code on the procedure game map can be scanned through the mediPuppet's hidden camera. Then, the information of next procedure pops up in the screen with images for the child and detail instructions for the parents.

## CHALLENGES

The experiments were conducted in a mocked exam room of a child behavior study lab, not in a real hospital environment. In the continue user study could involve a trained professional in a real exam room. In addition, considering that young children may not verbally express their feelings or emotions clearly, the sessions were recorded to assist in analysis, taking into account together with the comments from the parents in the post-interviews.

## SUMMARY

In this study, all children participants created a bonding relationship with mediPuppet, and engaged in the exam procedure through exploration and play. Emotion bonding and learning through exploration, help the young children (i.e., pediatric patients to be) overcome their anxiety during a hospital visit. Future version of mediPuppet could be a wearable version in the form of an attachable accessory, rather than limiting the features to be just one specific puppet. Preferably, children can bring their favorite toy to wear this device and accompany them during a doctor visit. Also, mediPuppet could include automatic recording of the hospital visit for procedure and data analysis or be incorporated into electronic health record

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