

# Enhancing Social Connections Through Automatically-Generated Online Social Network Messages

John J. Magee, Christopher Kwan,  
Margrit Betke

Department of Computer Science  
Boston University, Boston, MA, USA  
{ mageejo, ckwan, betke } @cs.bu.edu

Fletcher Hietpas

Boston Public Schools  
Boston, MA, USA  
fhietpas@boston.k12.ma.us

## ABSTRACT

Social isolation and loneliness are important challenges faced by people with certain physical disabilities. Technical and complexity issues may prevent some people from participating in online social networks that otherwise may address some of these issues. We propose to generate social network messages automatically from within assistive technology and augmentative and alternative communication software. These messages will help users post some of their daily activities with the software to online social networks. Based on our initial user studies, the inclusion of social networking connections may help improve engagement and interaction between users with disabilities and their friends, families and caregivers, and this increased interest can lead to the desire to use the assistive technology more fully.

## Categories and Subject Descriptors

K.4.2 [Social Issues]: Assistive technologies for persons with disabilities; D.1.2 [User/Machine Systems]: Human factors; H.5.2 [User Interfaces]: Input devices and strategies

## General Terms

Human Factors

## Keywords

Online Social Networking, Automatic Message Generation

## 1. INTRODUCTION

We investigate the use of online social networks for people with moderate to severe motor disabilities and their families and caregivers. Online social networks may help overcome communication barriers, but there are still many challenges [3].

Online social networks can help alleviate problems of loneliness and isolation for people with disabilities, but only if the technology works for the individual [2]. Some of the challenges people with movement disabilities face when they attempt to use existing online networks are slow communication rates, inaccessible elements on web pages such as small

links or buttons, inability to personalize interfaces, low literacy, lack of privacy (the caregiver is always present), lack of autonomy [2, 3], and inadequate computer literacy of caregivers.

To address these challenges, we propose to generate messages automatically that would help answer the question “What did I do today?” The software can keep a log of the user’s activities, e.g. what applications they use, what web pages they visit, what stories they read. The user can optionally annotate an activity or item to express their opinion about it (by applying a rating: like/dislike, thumbs up/thumbs down). At the end of the session, the user can update their social network with information and statistics about the session. This posting can include how much time the person used the computer and specific applications, what they liked or didn’t like. This allows the user with disabilities to participate in social media and connect with family and caregivers without having to enter a lengthy message with an alternative text entry method.

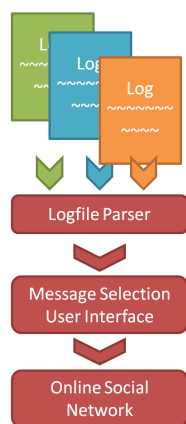
We work with people who use a mouse replacement interface called the Camera Mouse [1]. This interface tracks head motion to move a mouse pointer on the screen. We have used it with a variety of accessible software designed for people who cannot use a typical keyboard or mouse interface.

## 2. PROTOTYPE SYSTEM DESIGN

The prototype system can integrate with several online social networks to post messages. Such integration is accomplished via publicly available Application Programming Interfaces (APIs). In order to generate messages, the software must also interface with other software that is being used on the computer. There are several ways this integration can be accomplished depending on the ability to modify the software.

Assistive software that we create can be designed with integrated social networking features to generate the most detailed messages. Some existing closed-source software may be modified or configured to produce logs that can be analyzed to create messages. In the worst case, proprietary software can be monitored for focus to measure how long it is used.

A flowchart of the proposed system is shown in Fig. 1. In the prototype system, the system is more limited: only one log file can be processed and the user interface presents the user with a choice of sending the message or not. Future work will expand the functionality of software to offer the user more options and more complex messages.



**Figure 1: System flowchart. Each application produces logfiles, which are then parsed to present message options to the user. The selected message is then sent to the online social networking site.**

### 3. CASE STUDIES

To observe how students might benefit from easier access to social network communication, we visited a public school over a 5-month period. Three female students with cerebral palsy, all age 13, participated in our study. We also visited a male high school student in his home. Students at the school are quite engaged with a “points economy,” where they earn points for completing academic tasks. Language-impaired students would benefit greatly from having the ability to automatically post messages on social networks relating to their in-school achievements. Automatic message posting would enable many students to interact normally with the social network outside of their confined classroom.

We first conducted an evaluation of software usage with the Camera Mouse with participant *T*. Participants *L* and *G*, having seen *T* use the Camera Mouse and associated software, began asking to try it themselves. This positive social feedback cycle increased their engagement and desire to use the technology. *L* said “I saw [*T*] using it and thought ‘this looks like fun’ so I wanted to try it.” It is this social engagement we aim to foster in an online social network.

We observed *L* using the Camera Mouse to play the game EagleAliens, and then we showed her a potential social network posting (Fig. 2) and asked for her reactions. *L* does not use the internet at home and was initially not sure if she liked the idea. However, she indicated that she would want to share her game score or her work in class with her family or friends, adding “I think that would be cool, because then they would know how much work I did.”

*T* had been out of school for 5 weeks and had used the Camera Mouse on her own during that time. She indicated that it would have been good to share what she was doing with her classmates while she was away. *L* said that if they could share their scores, “. . . she would know what I got, and I would know what she got. . .” and that would be good “. . . because we might have something in common.” *T* indicated that she would be inspired if she saw online that her classmates had accomplished something.

All three participants expressed interest in sharing what they had done at school with family members who do not live

#### **Post to Facebook:**

Today I used the Camera Mouse for 20 minutes. I played the EagleAliens game for 15 minutes and my best score was 9/10 aliens at 2.3 seconds each!



**Figure 2: We showed our study participants this simulated online social network posting and asked them for their reactions.**

with them. *G* also indicated that she would try something new if she saw online that her classmates had tried it.

Participant *C* is a 16 year-old male high school student with cerebral palsy. After using the Camera Mouse with various software programs, we showed *C* the social networking posting message (Fig. 2). When asked if he would use this feature, he responded: “I would like it,” but also expressed privacy concerns. *C* thought that it was important for users with disabilities to have an easy way to communicate their thoughts online. He said that people with disabilities have things to share and say, communicate and express.

Our discussion with a special education director indicated that her students with communication or transportation challenges would definitely benefit from enhancing social interactions through automatically generated social network messages that would keep them engaged with their peers. Our study indicates that such messages could be beneficial both to producers and consumers of the message.

### 4. FUTURE DIRECTION

We plan to conduct an expanded user study with a fully functioning system to analyze longer term usage trends and social interaction effects. We also plan to make a future version available as a download.

### 5. ACKNOWLEDGMENTS

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