FrameDrops: A Mobile VideoBlog
for Workgroups and Virtual Communities

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ABSTRACT

In this paper FrameDrops is presented. FrameDrops is a mobile VideoBlog—it allows users to capture videos and pictures on the move with modern mobile phones, and to send these data with a comment and with information on the current geographical position to a FrameDrops server. FrameDrops servers automatically insert the data in a repository, and generate integrated interactive Web pages. FrameDrops can be used for various purposes where users want to easily capture information in-situ and share it with others.

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H.5.2 [**Information Interfaces and Presentation**]: User Interfaces – Graphical User Interfaces, User-Centred Design; H.5.3 [**Information Interfaces and Presentation**]: Group and Organisation Interfaces – Computer-Supported Cooperative Work.

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1. INTRODUCTION

Weblogs are digital diaries that can be produced and read with Web browsers [11]. Most Weblog systems provide integrated tools for creating new text entries and for sending them to Web-based Weblog servers. These servers then store the entries and present Web pages with both overviews (in reverse chronological order, so that the most recent entries are on top) and the individual entries [7].

With PhotoBlogs users cannot only create text, but also picture entries. They are often used for picture documentaries (e.g., BabyBlogs, or TravelBlogs) [11]. VideoBlogs additionally allow users to produce video entries [5].

Early Weblog systems were primarily developed for bringing

diaries online, newer Weblog systems aim to support communities of users who jointly collect and manage information on the Web. Nardi et al. [12] published a study on the motivation and behaviour of users of Weblogs and discovered several reasons for using Weblogs: to update others on activities and whereabouts; to express opinions on current topics; to seek other's opinions and feedback; to think by writing; and to release emotional tension.

Weblogs have been only recently discovered as groupware tools for the workplace. For instance, IBM published the 'IBM Blogging Policy and Guidelines' to motivate corporate Weblog use [15]. Other examples are Microsoft with a Weblog at TechNet [10]; and Sun with their Sun Bloggers [17].

In this paper the concept and implementation of FrameDrops is presented. FrameDrops is a mobile VideoBlog—it allows users to capture videos and pictures on the move with modern mobile phones, and to send these data with a comment and with information on the current geographical position to a FrameDrops server. FrameDrops servers automatically insert the data in a repository, and present this repository on integrated interactive Web pages. FrameDrops offers several innovative features and novel combinations of features, which are needed by workgroups and online communities [3]:

- Capturing and commenting as well as uploading videos, pictures, or text is very simple and can be done with standard mobile phones—thereby fostering universal access for contributing to shared multimedia archives.

- Collecting data in a shared multimedia repository offers greater flexibility for readers than an information push approach such as with email exchange.

- Capturing the position where the videos and pictures are taken allows to store valuable geographical context information, and to foster encounters of users who are at close locations.

Because of these reasons, the mobile VideoBlog FrameDrops is an elegant tool for workgroups and virtual communities. It provides a steadily growing base of entries, and through geo-referencing of entries it supports flexible interaction among users not only in the online world, but also in the real world. It can be used for various purposes where users want to easily capture information in-situ and share it with others.

This paper is organised as follows: in the next sections the concept of FrameDrops is presented. Then its user interface and its implementation are described. Finally, related work is discussed.

2. CONCEPT

FrameDrops supports users in creating and maintaining shared Web-based archives of video, picture, and text, as well as in later browsing through these archives. Users can capture videos and pictures on the go, annotate them, and send them to a shared FrameDrops server. The server processes the incoming data and automatically produces a new entry in the shared FrameDrops Weblog. All entries can later be retrieved and viewed with a standard Web browser. Subsequently, the underlying concepts of FrameDrops are presented.

Mobile Blogging: FrameDrops is a mobile Weblog and can be used anyplace and anytime. Additionally, FrameDrops' Web interface facilitates later changes—this is particularly convenient for entering or altering large amounts of text.

Automatic Positioning of Entries: FrameDrops can automatically position entries via GPS, and put entries in a geographical as well as chronological context. This coupling of the users' coordinates in the real world to the online world stimulates real-world encounters of users who have so far only met online.

Shared Information Base: Many users share Weblogs because they perceive exchanging data via personal emails as intrusive and feel obliged to reply [12]. FrameDrops supports the joint creation of shared information bases, which motivates users to add entries. The entries are online and users can annotate them, or attach greetings, hints, and links to related information.

Browsing Entries: FrameDrops provides an easy and intuitive Web interface to the information base and its individual entries. It is based on a lightweight Macromedia Flash client that seamlessly integrates individual entries into overview pages showing comments and static picture frames of videos.

It provides simple interaction for viewing video entries.

3. USER INTERFACE

FrameDrops' user interaction is easy and straight-forward: users capture a picture or video, create a new email and write a comment in the body of the email, and send this email with the attached picture or video to the FrameDrops server.

Figure 1 shows a screenshot of the FrameDrops overview of entries. The design of this overview page is based on two requirements: the interaction of the user with the system should be as simple as possible and neglect unimportant details, and no new software should be needed.

On the overview page the user can see a list of the most recent entries in reverse chronological order. An integrated calendar provides a navigation interface to earlier entries. For each entry, the overview page shows the date and time of creation, a title, and a short description. Additionally, a picture shows a little preview, and an overlaid icon informs about the type of the entry (e.g., video, picture, text). In a schematic map the locations of the individual entries are visualised as little blue dots. Hovering the mouse over a blue dot fades in the title of the respective entry.

When the user clicks on an entry, the other entries fade out, and the complete information on the respective entry is shown. All elements of the entry smoothly fade in. The video controls for starting or stopping the video, moving backwards or forwards in the video, and changing the volume only fade in when the user hovers the mouse over the image of the video. On the bottom of the page the user can see information on the creation date and time as well as a globe icon, the latter allows users to move back to the schematic map and shows the position of the active entry.
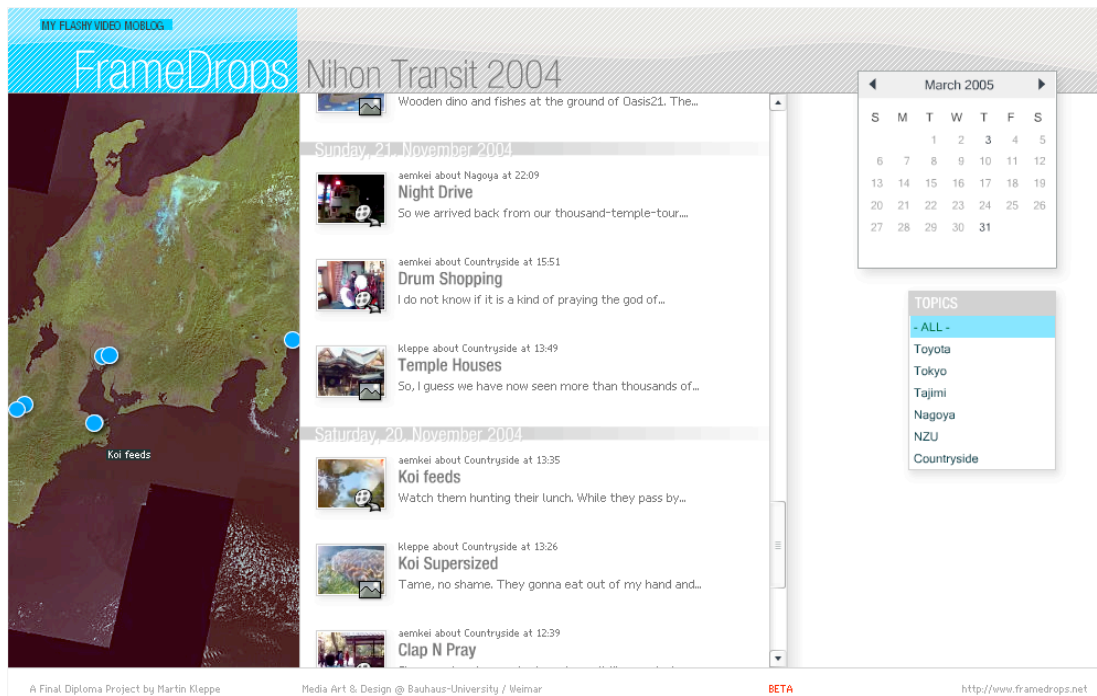

Figure 1. FrameDrops overview of entries.

4. IMPLEMENTATION

The FrameDrops software architecture consists of a central server, of standard applications on the mobile phone, and of a Web browser with a Flash plugin. Figure 2 shows the FrameDrops software architecture and the flow of information through the architecture. It is described below.

4.1 Creating Entries

In order to create video or picture entries in FrameDrops the user needs a mobile phone with a picture or video camera, GPRS [4], and GPS [18]—this technology is available in mobile phones such as the Motorola A845, or the Motorola E1000. The user takes a video or picture, and stores it on the mobile phone. The GPS module automatically writes position information into metadata. Then, the user sends an email with the video or picture in the email attachment and the description in the email body via GPRS to the FrameDrops server.

4.2 Conversion at the Server

The FrameDrops server is based on the Antville Weblog system [2] and extends it with functionality and interfaces for publishing video entries from mobile phones. The Antville Weblog system provides the Helma Object Publisher server, which stores the descriptions of the entries as well as the metadata in a database, and the videos and pictures as files on the hard disk.

The processing and conversion of the FrameDrops server works as follows: at the FrameDrops server a standard SMTP server receives and stores incoming emails. The PUCK module of Antville periodically contacts the SMTP server and checks for new email and analyses the sender of the email. Emails from unauthorised users are deleted. The remaining emails are parsed: incoming video attachments are converted from the standard 3GPP format of the 3rd Generation Partnership Project [1] to the Flash video format (FLV) of Macromedia and a picture frame (JPG) is produced; and incoming pictures are already in JPG format and are simply adapted in scale. The metadata [6] of incoming pictures provide valuable information on the creation date and time, on the picture dimensions, on positions, on the camera used, and so forth and are extracted. The video and picture files are then sent to the Antville Weblog system via XML-RPC [19]. Antville returns a macro code (i.e., code consisting of attributes and values describing the object identifier and layout). Finally, the FrameDrops server generates the description by combining information from the body of the email, the extracted position information, and the macrocode and sends it to the Antville server.

4.3 Content Presentation and Browsing

FrameDrops presents its overview and individual entries in a Web page using an embedded Flash object (SWF). This Flash object manages the whole communication with the FrameDrops server via XML-RPC. Upon request, pictures and videos are loaded in JPG and Flash format respectively. Since most Web browsers currently feature a Flash plugin in their standard distribution, the user do not need to install any software.

The Flash object also manages the positioning of the entries in maps. For positioning the entries in the respective maps, the free maps from the WMS Global Mosaic Server [13] are used, which allow a positioning precision of 15 meters. All entries are geo-referenced and contain information on the longitude and latitude of their creation position. Entries from devices without a positioning feature are added without geo-reference. The Flash object then overlays all geo-referenced entries on top of the respective map.

Flash offers several advantages for the seamless presentation of text, pictures, and videos: the design is more aesthetically pleasing than pure HTML; content can be transmitted upon request; videos can be seamlessly integrated; and the whole positioning and layout information is loaded in the Web browser only once reducing transmission overheads.
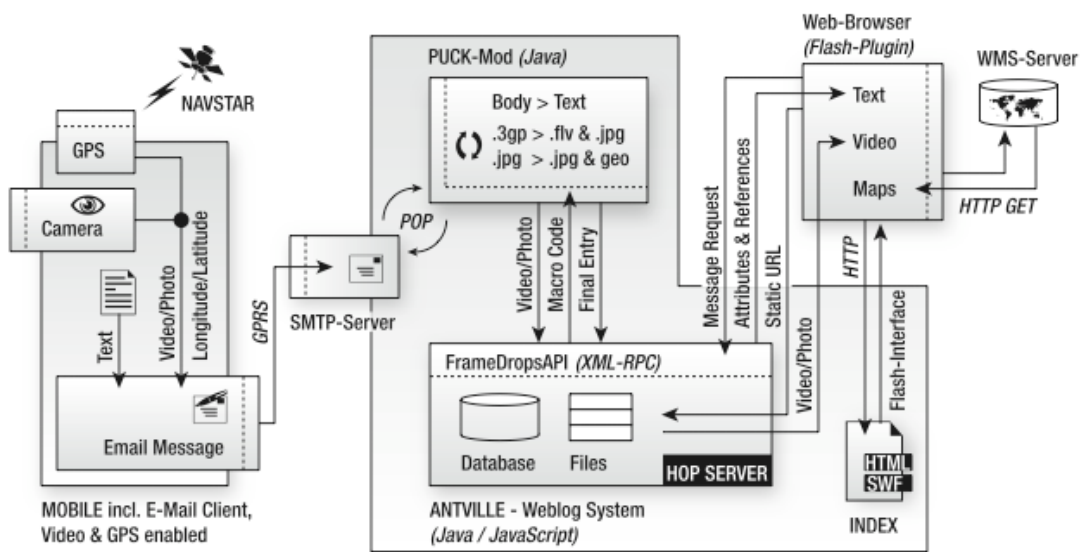

Figure 2. FrameDrops software architecture.

5. RELATED WORK

Only recently some systems and prototypes have been developed, which are similar to FrameDrops—either concerning the data formats or concerning the positioning of the authors and entries.

Flickr [9] is a platform for publishing pictures from mobile phones. Users can specify tags for photos, which are then used as categories and keywords for search requests. The external module *Mappr* [16] can analyse these tags, extract location information, and position the photos in online maps. However, this positioning only works in major U.S. cities. And, due to the large number of photos that may be created in high proximity, the positions may clutter. Like FrameDrops Flickr in combination with Mappr facilitates the creation of Weblog entries on the move. Yet, FrameDrops also supports video and text entries, and works around the globe.

TokyoPicturesque [14] also supports the positioning of photos. Users of GPS enabled mobile phones can send an email with their picture to a server, which inserts the photos into a map of Tokyo, Japan. Later, users can see a satellite picture with overlaid dots of the positions of the photos in a Web browser. Hovering the mouse over a dot fades the respective picture in. Similar to FrameDrops TokyoPicturesque allows users to create and upload photos on the move. These photos can also be positioned. However, this system does not support text and video entries.

Finally, Textamerica.com [8] is a Web site of the American Camera Phone Moblog community, which allows registered users to maintain their personal VideoBlog. Videos, pictures, and text can be uploaded and later commented by other users. Yet, this system does not support positioning.

6. DISCUSSION

In this paper a mobile VideoBlogging system was presented—especially its concept, user interface, and implementation were described. The FrameDrops system is completely implemented, and has been used in our research group. A systematic user evaluation is currently missing. Still, several users of FrameDrops provided highly positive feedback—particularly concerning its advanced functionality and technology in combination with its easy and straightforward user interaction.

The existing implementation of FrameDrops has its limitations: current mobile phones with GPS extension can write information about the camera's position in the metadata of JPG pictures, but not in videos. Therefore, when capturing a video users also have to take a still picture for capturing the position information. Furthermore, some users pointed out that creating entries on the move is a great feature, but that they miss features for browsing and viewing entries on the move. Finally, FrameDrops only provides one map with all entries of all users of the community; it is not possible to follow an individual user's path.

7. ACKNOWLEDGEMENTS

8. REFERENCES

[1] 3GPP. 3rd Generation Partnership Project. http://www.3gpp.org/, 2005. (Accessed 21/5/2005).

[2] Gaggl, R., Schaefer, T., Wallnoefer, H., Mueller, C. and Unterluggauer, M. Project Antville. http://project.antville.org/, 2005. (Accessed 15/2/2005).

[3] Gross, T. Design, Specification, and Implementation of a Distributed Virtual Community System. Proceedings of PDP 2004. IEEE Press. pp. 225-232.

[4] GSM Association. GSM World - What is GPRS? http://www.gsmworld.com/technology/gprs/intro.shtml, 2005. (Accessed 15/2/2005).

[5] Hoem, J. Videoblogs as 'Collective Documentary'. In BlogTalk Symposium 2.0. 2004.

[6] JEITA. Exif Version 2.2. http://www.kodak.com/global/plugins/acrobat/en/service/digCam/exifStandard2.pdf, 2005. (Accessed 15/2/2005).

[7] Kumar, R., Novak, J., Raghavan, P. and Tomkins, A. Structure and Evolution of the Blogspace. CACM 47, 12 (Dec. 2004). pp. 35-39.

[8] Leigh, J., Hoar, C., Charles, J. and Honnick, S. Textamerica.com. http://www.textamerica.com, 2004. (Accessed 19/5/2005).

[9] Yahoo!. Welcome to Flickr - Photo Sharing. http://www.flickr.com/, 2005. (Accessed 19/5/2005).

[10] MS. TechNet Blog. Microsoft Corporation, http://blogs.technet.com/, 2005. (Accessed 23/5/2005).

[11] Nardi, B.A., Schiano, D.J. and Gumbrecht, M. Blogging as Social Activity, or, Whould You Let 900 Million People Read Your Diary? Proceedings of CSCW 2004. ACM. pp. 522-531.

[12] Nardi, B.A., Schiano, D.J., Gumbrecht, M. and Swartz, L. Why We Blog. CACM 47, 12 (Dec. 2004). pp. 41-46.

[13] NASA. OnEarth, Server of the Landsat 7, WMS. http://onearth.jpl.nasa.gov/, 2005. (Accessed 15/2/2005).

[14] PPP and KS. tokyo picturesque ver.1. PowerPlant Partners Inc. and Karate System, http://www.tokyo-picturesque.com/v1/, 2004. (Accessed 19/5/2005).

[15] Snell, J.M. IBM Blogging Policy and Guidelines. http://www.snellspace.com/IBM_Blogging_Policy_and_Guidelines.pdf, 2005. (Accessed 23/5/2005).

[16] Stamen Design. Mappr! Where It's At. http://www.mappr.com/, 2005. (Accessed 19/5/2005).

[17] Sun. Sun Bloggers. Sun Microsystems, http://blogs.sun.com/roller/main.do, 2005. (Accessed 23/5/2005).

[18] USNO. USNO NAVSTAR Global Positioning System. http://tycho.usno.navy.mil/gpsinfo.html, 2005. (Accessed 15/2/2005).

[19] UserLand Software Inc. XML-RPC Home Page. http://www.xmlrpc.com/, 2005. (Accessed 21/5/2005).