Evaluating Ad Hoc Networks with FRED

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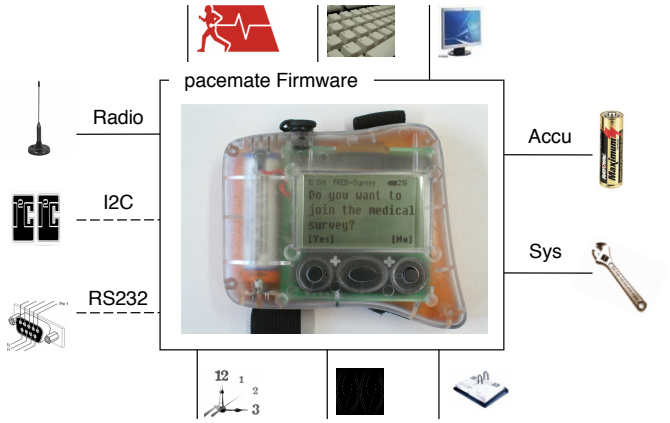


Fig. 1. Pacemate device showing the invitation to join a survey.

I. Goals of the Demo

Simulations were standard in the Mobile Ad Hoc Network (MANET) research community for years. New protocols and algorithms were validated via simulations by network simulators such as ns2 or GloMoSim. However, first experimental results show that simulation models for Ad Hoc networks are far from being realistic and protocols developed in simulations failed in real world environments.

In this Demo we present a well suited new application that fulfils important properties for a sound evaluation of ad hoc network protocols:

- We can easily find hundreds of volunteers.
- Users move predictable in a given area.
- Start and end of the experiment are well under control.
- Communication patterns can be defined in advance by the application developer.
- We can study MANET protocols in a real application.

FRED (Flexible Radio Enabled Dialog) is an enhanced TED-System that allows asynchronous surveys or quizzes with a multi hop radio network, where individual participants conduct the survey independent of others. It is based on the *pacemate* (see Figure 1) sensor network platform that provides a comfortable lightweight housing, a simple radio interface and an intuitive GUI. With about 500 *pacemates* we have a sufficient number of devices to handle large surveys and protocol test setups.

Conference participants are encouraged to participate in *FRED* and experience the advantages to conduct protocol evaluations as well as user acceptance surveys.

For this purpose, we will hand out a sufficient number of *pacemate* devices to the participants and invite them to take part in a survey. The live results of the survey will be presented on Laptop screens at our demonstration booth (see Figure 3). By using a multi hop wireless routing protocol for the communication between the sensor nodes, *FRED* allows the users to move freely around during these surveys as illustrated in Figure 2.

We plan to run a general survey about usage of Ad-Hoc Networks and the *FRED*-System. But if the organizers are interested, we hereby offer an online-Evaluation of the MobiHoc-Conference with the *FRED* System during the Demo-Session. Feel free to contact us.

To demonstrate the applications flexibility and to do protocol evaluations with this system, we successfully run a high tech quiz rally at a fair where we motivated the participating students with an award and a lottery. Furthermore, we applied *FRED* to evaluate courses at our university last semester. In both cases we were able to acquire volunteers easily with *FRED* and performed real life protocol evaluations in a large network setup.

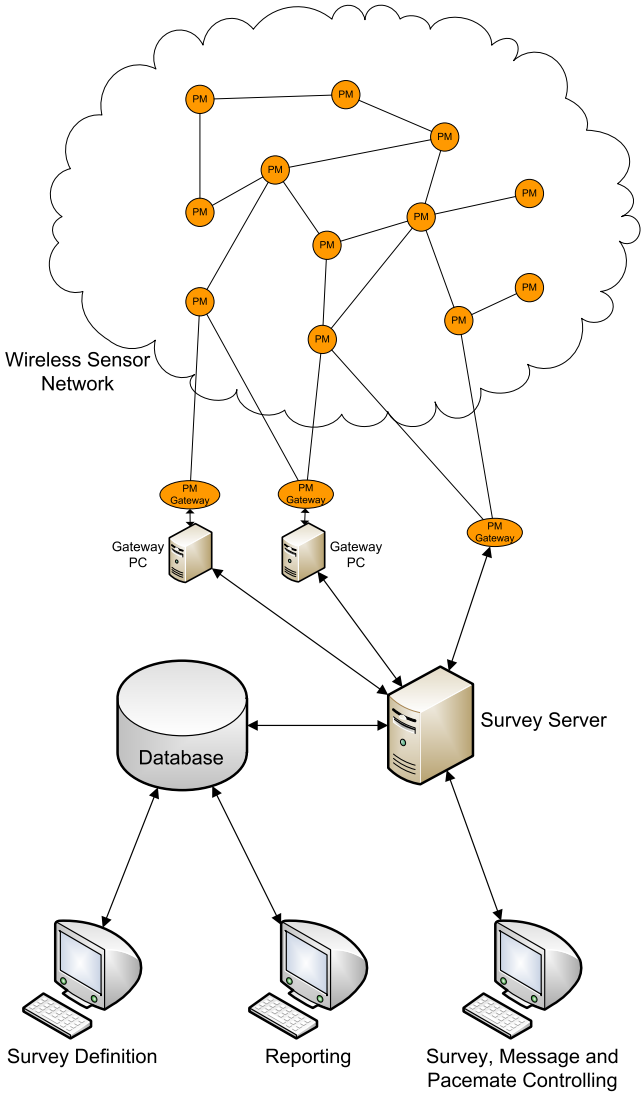


Fig. 2. System Overview of *FRED*.

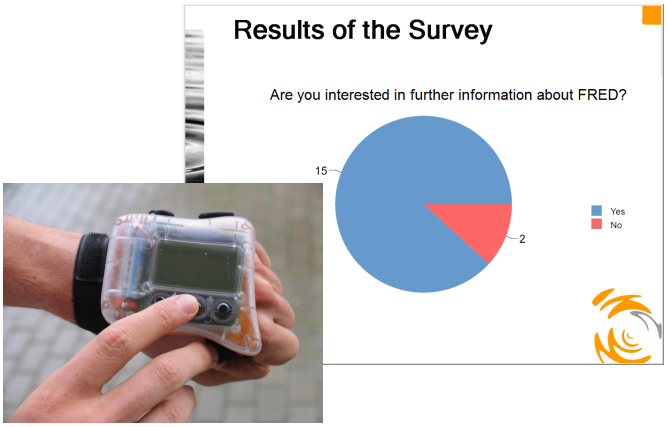
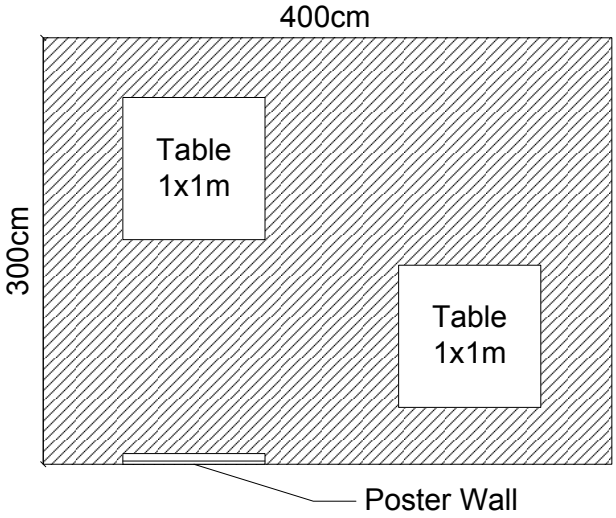


Fig. 3. Survey participant using the *pacemate* device and screenshot of the presentation of live results of a survey.

II. Space needed

For our booth a space about *3 x 4 meter* is needed. The following figure shows a possible setup of our demonstration booth.



III. Setup time required

We need *20 to 30 minutes* for the setup.

IV. Facilities needed including power and Internet/wireless access

- 2x 100-240V, 1.5A power supply for Laptops.
- 1x poster wall for a DIN A0 information poster.
- 1x big table (1 x 2 meter) or two small tables (1 x 1 meter) with a height between 80 and 110 cm).

V. URL with extra information

Further information about the *FRED* system and the *pacemate* platform can be fount at:

- http://www.marathonnet.de
- http://www.itm.uni-luebeck.de/projects/fred/index.html

VI. Acknowledgements

FRED was developed within the MarathonNet project which was funded by the Klaus Tschira Foundation, Heidelberg, Germany. More information is available at http://www.marathonnet.de.