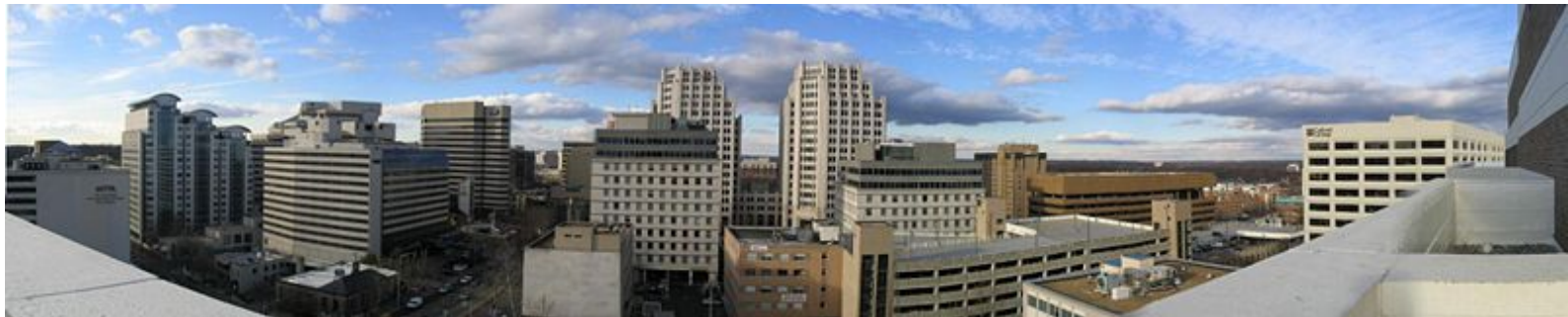# Family reunification: Problem

After a disaster

- Local or wide-area displacements
- Hospitals often a focal point
- Face flood of inquiries about the missing
- Staff busy with patient surge
- Need solutions – low impact on hospitals and relief workers

Bethesda – *panoramic view*

George Thoma, Ph.D.
Chief, Communications Engineering Branch
U.S. National Library of Medicine, NIH

U.S. National Library of Medicine NLM

COMMUNICATIONS ENGINEERING BRANCH

Lister Hill National Center for Biomedical Communications

LOST PERSON FINDER

Solutions
Hospital-based **and** *Community-wide* **systems**

- **People Locator™ – a Web site to**
  - **Acquire photos and metadata (name, age, location) of** *missing* **or** *found* **people**
  - **Allow direct search by public**
  - **Notify by email and on wall displays**
  - **First deployed for Haiti earthquake 2010; later for Japan, Philippines**

- **Alternative ways to enter/search for data**
  - **TriagePic – for hospital staff to record photos and metadata, and direct patients to treatment zones**
  - **ReUnite™ – iPhone app**
  - **Laptop, personal devices (**cell phone, Blackberry**)**
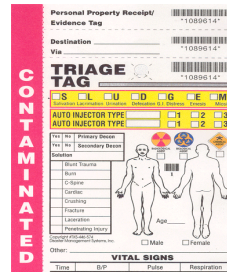   - **Structured form or in email subject line**

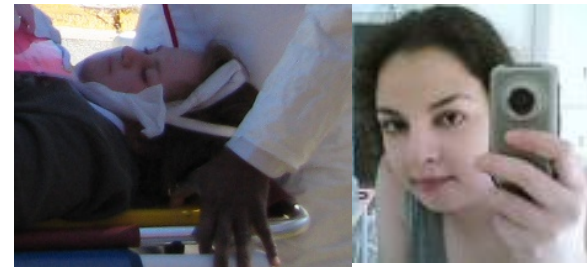# On the day of the disaster...
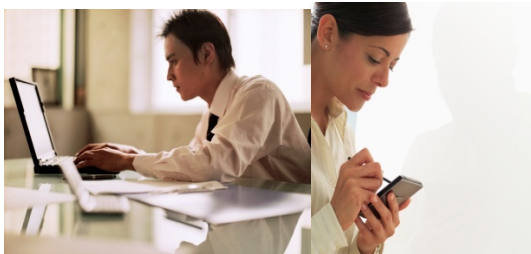## *Hospital-based system*

Mass casualties → **1** → **Injured are triaged** → **2** → **Staff/volunteers capture text & photos of victims**

3 ↓

LPF Database (MySQL), Web server, Image file storage, Email interface

Public search & entry of photos & descriptions via LPF Web site, mobile email ← **5** →
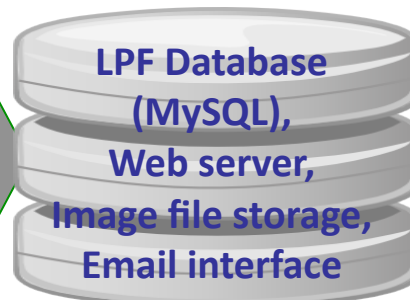
4 → **Notification wall displays**

LOST PERSON FINDER

Multi-agency disaster drills (2009, 2010)
Suburban and Military Hospitals, Bethesda
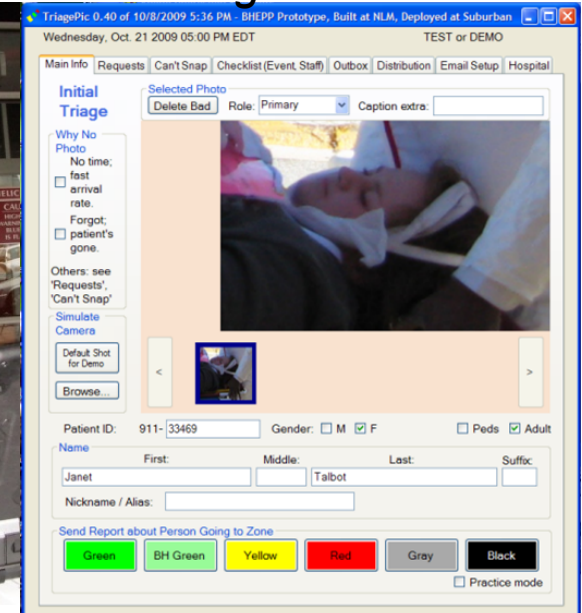
Victims assisted

Picture taken

Notification Wall for family

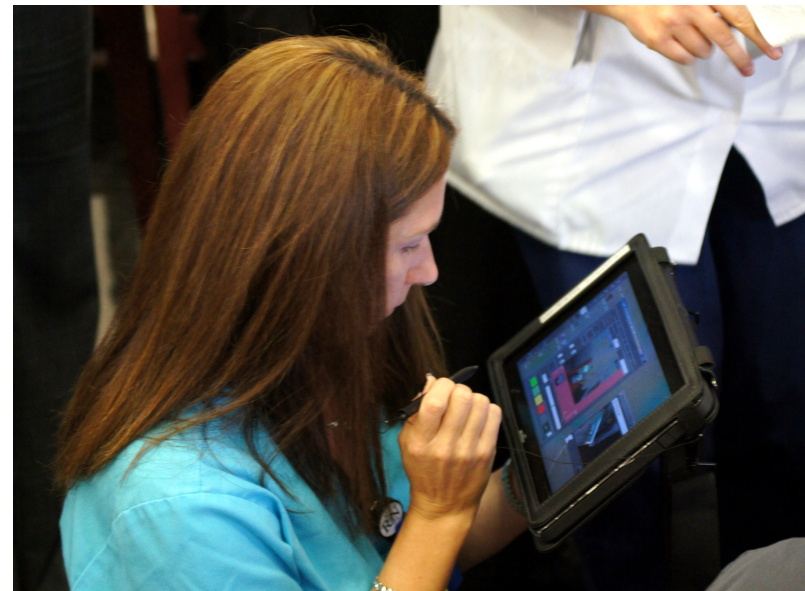**Triage staff**

TriagePic software

Capitol Shield disaster exercise – October 2011
TriagePic used for family reunification

Arrival of "victims" at Suburban Hospital

Hospital staff use Lister Hill Center's TriagePic to capture photo and metadata
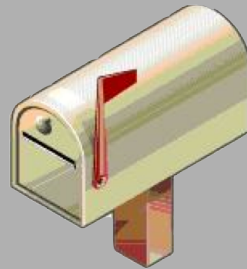
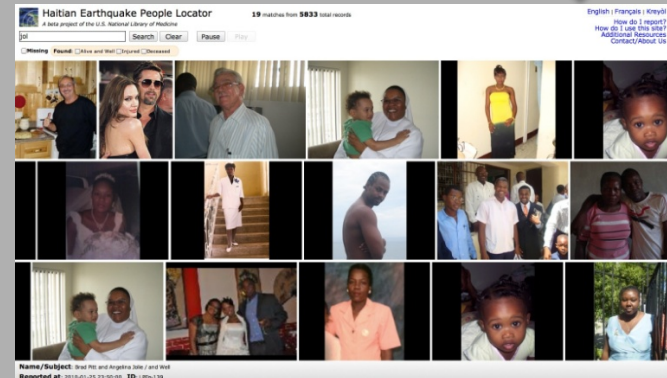**NLM People Locator (PL)**

Community-wide system

ReUnite iPhone App

disaster@mail.nih.gov

NATIONAL LIBRARY OF MEDICINE

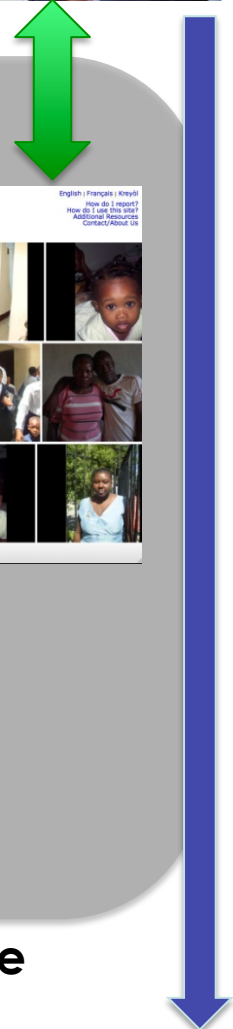**Interactive Notification Wall**

Blackberry & other smartphones (To be developed)

LPF Database (MySQL), Web server, Image file storage, Email interface

PFIF Data Exchange (For interoperability)

powered by **Google** *Person Finder*

NLM People Locator
pl.nlm.nih.gov

CMAX 2010 People Locator *Beta*
U.S. National Library of Medicine
Lister Hill National Center for Biomedical Communications

Username
Password
Sign In
No account? Sign Up

Event [CMAX 2010 ▼]   Language [English ▼]

Search for a Person
Report a Person
Resources

Main
How do I sea...   ...son?
...bout Us
Links
...ntact us

This is an organized online bulletin board to aid in locating someone after a disaster.

Anyone may use the search feature, without logging in. Get basic information about someone missing or found, including photos, ...
reported by family members, friends, or participating local hos...

Menu: select specific event

To do more, create a login account with your contact informat...

- Report someone as missing, and include photographs of them
- Update that report, e.g., if the person is found or their status changes
- Share the ability to update a report with family members and friends

Menu: select language

Search for a Person

Report a Person

Participating local hospitals can report basic information about arriving disaster victims. (Suburban Hospital's implementation is furthest along.)

The site does no automatic notification at this time, so check back periodically. But hospital personnel may contact you.

version: r4693   Build Time: Wed Oct 13 18:24:04 EDT 2010

Hosted and Customized by the
National Library of Medicine

Funded through the
Bethesda Hospital Emergency Preparedness Partnership

Powered by Sahana

PL Search results

Search for a Person
Report a Person
People I'm Tracking
Resources
TriagePic
My Settings

Search For...

[Enter a name...]   [Search]

Found 51 out of 80 Records   Pr

Page - **1** 2 3 | Results Per Page - [25 ▼]

Display Options

Sort By ↓ [Time ▼]

Mode [Interactive ▼]

Status
☑ Missing
☑ Alive and Well
☑ Injured
☑ Deceased
☐ Unknown

Gender
☑ Male
☑ Female
☑ Other/Unknown

Age
☑ Youth (0-17)
☑ Adult (18+)
☑ Unknown

Source
☑ Suburban Hospital
☐ Navy Medical Center
☑ Public/Other

MariaB Bakar Age Group: Adult Gender: Female Updated: 11/4/10 @ 2:36 PM — Missing	**Joseph Garcia** Age Group: Adult Gender: Male Updated: 11/4/10 @ 2:14 PM — Missing

William Duran
Age Group: Unknown
Gender: Male
Updated: 10/15/10 @ 10:48 AM
Injured

Janie Daniel
Age Group: Unknown
Gender: Female
Updated: 10/15/10 @ 10:47 AM
Injured

Dolores Smith
Age Group: Unknown
Gender: Female
Updated: 10/15/10 @ 10:45 AM
Injured

Pat Brosius
Age Group: Unknown
Gender: Female
Updated: 10/15/10 @ 10:42 AM
Injured

Josie cmax
Age Group: Unknown
Gender: Female
Updated: 10/14/10 @ 12:39 PM
Injured

Unknown name
Age Group: Adult
Gender: Male
Updated: 10/14/10 @ 12:21 PM
Alive and well

Unknown name
Age Group: Adult
Gender: Female
Updated: 10/14/10 @ 12:20 PM
Alive and well

Unknown name
Age Group: Adult
Gender: Male
Updated: 10/14/10 @ 12:18 PM
Alive and well

Unknown name
Age Group: Adult
Gender: Male
Updated: 10/14/10 @ 12:18 PM
Alive and well

Unknown name
Age Group: Adult
Gender: Male
Updated: 10/14/10 @ 12:18 PM
Alive and well

Unknown name
Age Group: Adult
Gender: Female
Updated: 10/14/10 @ 12:15 PM
Alive and well

Unknown name
Age Group: Adult
Gender: Male
Updated: 10/14/10 @ 12:15 PM
Alive and well

Justin cmax
Age Group: Unknown
Gender: Male
Updated: 10/14/10 @ 12:03 PM
Injured

Interactive Notification Wall

Research challenges

- **Image processing for face recognition**
  - *Purpose: to allow search by photo*
  - **Problems: low res, occluded faces, varying pose, confusion with non-face images**
  - **Extract image features (SIFT, SURF) to localize faces**
  - **Extract color, texture features to index face images**
  - **Build system to match features from incoming photo to stored features**
  - **Deliver top 5 best matches**

- **Image processing for photo de-duplication**
  - *Purpose: to reduce search space for efficient searching*
  - **Extract image features from whole image (photo)**
  - **Match features of stored photos, and discard duplicates**
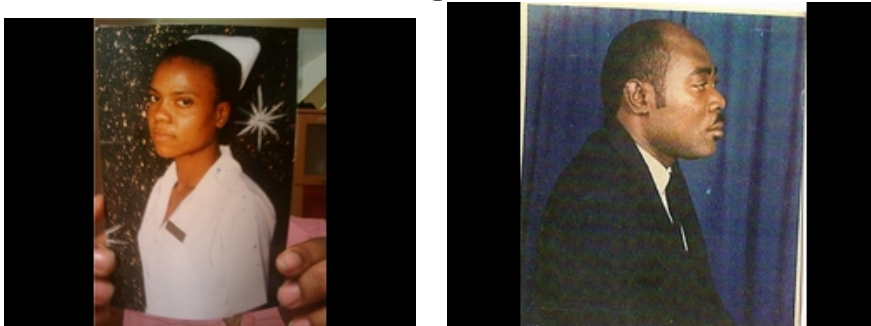
Image processing challenges
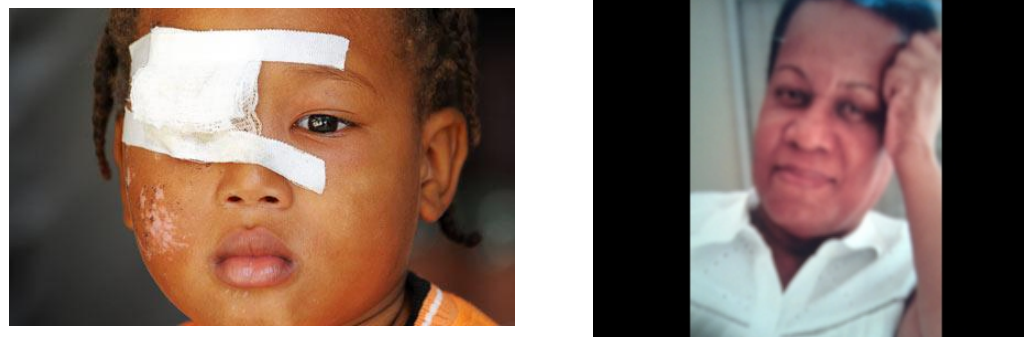
Variability in lighting

Misidentified as face

Variability in pose

Low resolution

Occluded images

Other research challenges

Parse and structure free-form text input (NLP)

Authenticate searchers (while keeping burden low)

Seek best ways to
    Organize contents for searching
    Organize contents to display on desktops, handhelds, wall screens
    Retrieve information from social sites

Expand to report missing animals (*Lost Pet Finder*)