



Random Hacks of Kindness

*Hacking for Humanity*

rhok.org

# HACKING FOR HUMANITY: INCREASING PARTICIPATION IN HUMANITARIAN FREE/OPEN SOURCE SOFTWARE DEVELOPMENT THROUGH “RANDOM HACKS OF KINDNESS” GLOBAL HACKATHONS

Capstone Project Report in Fulfillment  
of Master of Science Degree in  
Professional Studies at RIT's Center  
For Multidisciplinary Studies



foss.rit.edu

J. R. DeCausemaker  
May 15th, 2013



# Who Am I?

## **RIT Lab for Technological Literacy**

Research Associate  
2011 to present

## **RIT Center for Student Innovation**

Hacktivist & Storyteller  
2009 to present

## **opensource.com**

Contributing Author  
2009 to Present

## **CIVX.us**

Co-Founder  
2008 to Present

## **NTID/PEN International**

Educational Coordinator  
2010

## **Software Freedom Law Center**

Campaign Volunteer  
2008

## **New York Public Interest Research Group**

Community Outreach Director  
2007-2008

# Who Am I?

**A.A.S. Business '08**

**Organizational Change & Leadership  
Certificate '08**

**B.S. Applied Arts Sciences '08**

Concentrations: Business, Writing Studies,  
Organizational Change & Leadership, Political  
Science

**M.S. Professional Studies '13**

Concentrations: Communications & Media Technology  
and Public Policy

# Course Concentrations

## Communications

Electronic  
Communications &  
Society

Crafting the Message

Digital Design

## Public Policy

Special Topics: Community  
Economic Development

Public Administration &  
Management

Science/Technology Policy  
Seminar

## Free/Open Source Software (unofficial)

Special Topics: Security  
Technology

Seminar in Interactive  
Games & Media

Humanitarian Free/Open  
Source Software Development



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# Presentation Overview

- |                           |                      |
|---------------------------|----------------------|
| 1 - Course Concentrations | 7 - Steps Taken      |
| 2 - Contexts & Trends     | 8 - Project Results  |
| 3 - Problem Background    | 9 - Next Steps       |
| 4 - Project Overview      | 10 - Lessons Learned |
| 5 - Project Objectives    | 11 - Attribution     |
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# Problem Background

- Thousands of volunteers who answer the call to service each year, though motivated, do not possess the requisite technical skills to build their own solutions.
- Aid organizations must prioritize their budgets to meet physical needs first.
  - Technology solutions are often prohibitively expensive
  - And are problematic to fund due to intellectual property issues.
- Technical professionals are in high demand,
  - often drawn to high technology regions with high-salary, private sector jobs (not volunteer work) to repay the high-cost of education.
- Even with the efforts of Humanitarian hackers doing weekend or side projects, there are still many, many more problems than problem solvers.

# Two cutting edge 21<sup>st</sup> Century Movements

## Participatory Development

- People in need work with developers to improve their own lives
- Provides sense of ownership
- More sustainable and effective

## Free/Open Source Software

- Programmers around the world work together to build tools
- Raise standard of living for themselves and their communities

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**Ban Ki-Moon**

**Secretary General, United Nations**

**2<sup>nd</sup> Annual Random Hacks of Kindness  
Keynote Address**

<http://www.unglobalpulse.org/blog/un-secretary-general-appeals-global-open-source-community>



# Learning Objectives

## **Communications**

Needed for nearly all stages of Project

## **Ethical Reasoning**

The premise of the entire capstone was "Hacking for Humanity"

## **Critical Thinking**

Considering short/long term benefits  
Maximize effort, conserve energy

## **Problem Solving**

Choose specific challenges and real-world problems

## **Integrated learning**

Learning by doing. Computer and Citizen science, applied.

# Project Overview

Hacking for Humanity

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## Pre-Capstone Activities

Organize and Run a "Hackathon"

- Coding + Marthon = Hackathon
- 24+ hour Social Coding Event
- Work on Challenges submitted by NGO's, Aid Organizations, and Volunteers

## Capstone Activities

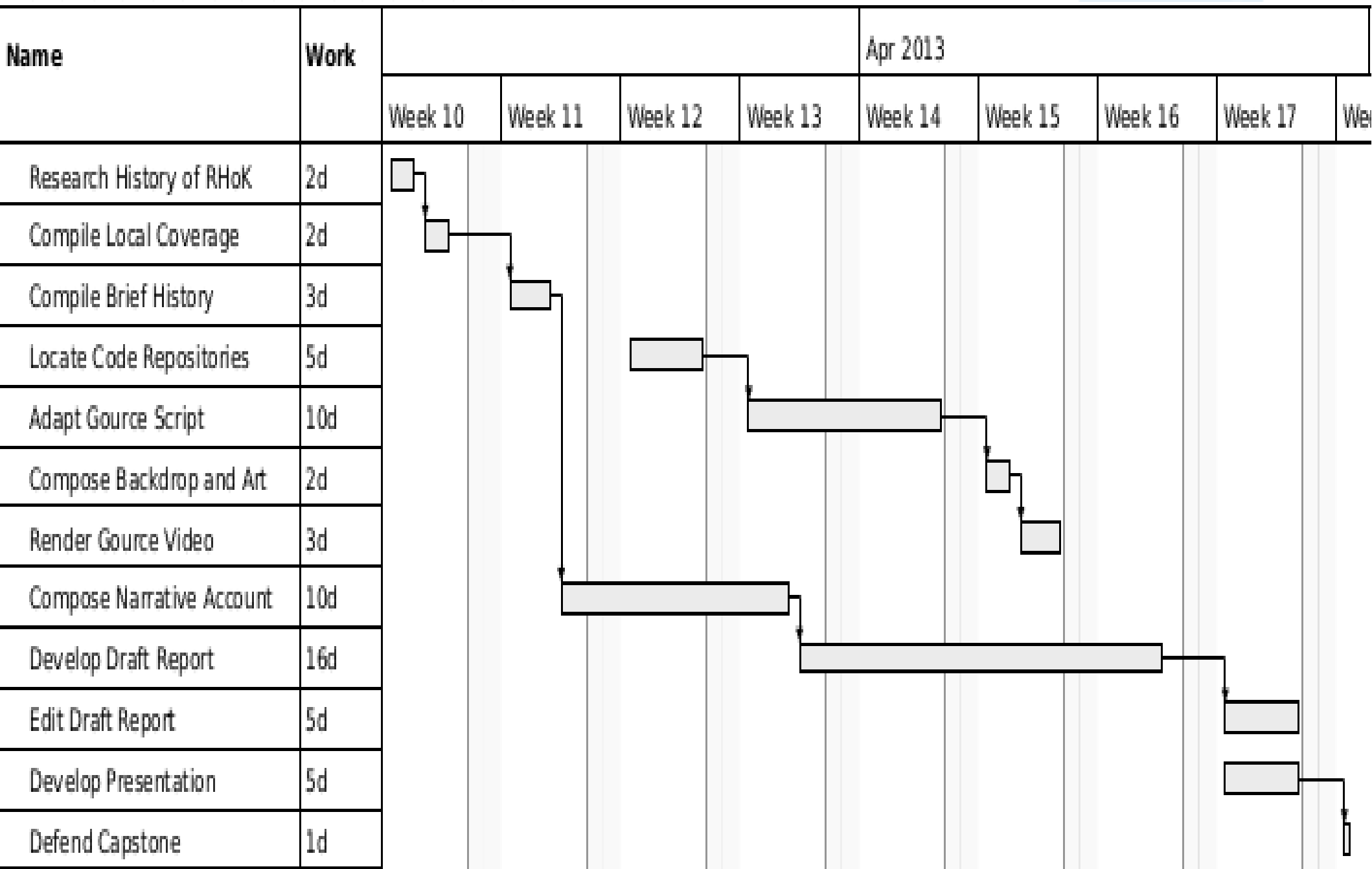
Create and tell the Story

- Report
- Presentation
- Visualization

Publish and Distribute the Results

- Narrative and Source Code

# Timeline



# Pre-Capstone Activities

1. Get the Idea
2. Apply for License
3. Schedule the Venue
4. Create the Flyer
5. Create the Event Listing
6. Attend the CapitolCamp Conference (Albany, NY)
7. Draft the Press Release
8. Confirm the Keynotes
9. Release Press Release
10. Secure the Swag
11. Conduct the Radio Interview
12. Handle the Keynotes
13. Run The Event at RIT
14. Meet the Press
15. Serve the Meals
16. MC the Presentations
17. Catch my breath

# Capstone Activities

17. Research RHoK Organization
18. Compile Press Coverage
19. Review Literature
20. Locate Code Repositories
21. Adapt Multi-Source Scripts
22. Adapt RHoK-Media Artwork
23. Produce Report
24. Produce Presentation
25. Defend Capstone

# Project Results

Media Reports

Hackathon Outcomes

Source Code Visualization

A decorative background element consisting of a grid of blue squares of varying sizes and opacities, scattered across the left and top portions of the slide.

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# Media Reports

# RIT Press Release

## University NEWS

[contact us »](#)

April 19, 2013



66°



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[Science](#)

[Student Affairs](#)

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### Colleges

### RIT Media

### RIT Resources

### For Journalists

## Hacking for Humanity: RIT Participates in Global Hack-a-thon to Affect Change

*Event is part of Random Hacks of Kindness Global Hack-a-thon 2012*

Nov. 27, 2012

by Kelly Sorensen

[Follow RITNEWS on Twitter](#)

Random Hacks of Kindness is an innovative twist on what are traditionally known as random acts of kindness. It's a global initiative made up of a community of more than 5,500 innovators in more than 30 countries developing open source technology to address some of the world's most complex issues.

Rochester Institute of Technology is participating and is a host site of the [Random Hacks of Kindness](#) Global Hack-a-thon from 9 p.m. Dec. 1 to 9 p.m. Dec. 2 in Student Innovation Hall in the University Services Center on the RIT campus. **The event is free and anyone is welcome to participate. To register, go to <https://rhhoktheroc2012.eventbrite.com>.**

Random Hacks of Kindness has hosted four global events to date with more than 4,000 participants. Governments, emergency responders and citizens have used the solutions developed by this community.

RIT students and faculty will be among those working with federal, state and international organizations at this weekend's global event. Organizations such as the [Peace Corps](#) have identified issues their volunteers are facing in the field, posting a list of problems on its website to be addressed during the hack-a-thon. Participants also will have the opportunity to help New York residents affected by Hurricane Sandy with a mobile website for Gov. Andrew Cuomo's [storm resources page](#) that's currently in the prototype stage.

Sean Herron, a member of NASA's Open Government team, will be among those attending the event. He works to facilitate open source and open data projects throughout the agency and promotes the use of technology solutions to solve common problems. Herron previously worked in the Space Operations Office at NASA headquarters, where he contributed to public outreach projects involving the space shuttle and International Space Station. He is an avid Web developer and advocate for engaging the public in NASA's mission of exploration and discovery.

Also in attendance will be Rob Bishop, a developer with the Raspberry Pi Foundation, a charitable organization founded with the goal of promoting the study of computer science and other related topics.

Global sponsors of Random Hacks of Kindness include The World Bank, NASA, HP, Google, Microsoft and others. RIT's event is sponsored by The Office of the RIT Associate Provost of International Education and Global Programs, the Simone Center for Student Innovation and Entrepreneurship and the RIT Lab for Technological Literacy. The Lab for Technological Literacy is sponsored by StormFrog Inc. and Red Hat Inc.

Find other stories related to [newsrelease](#), [ritcenters](#), [computing](#), [global](#), [innovation](#), [research](#).





## HenriettaPost.com

### RIT to participate in Random Hacks of Kindness

By Staff reports

GateHouse News Service

Posted Nov 27, 2012 @ 02:47 PM

Rochester, N.Y. — Rochester Institute of Technology is participating and is a host site of the **Random Hacks of Kindness** Global Hack-a-thon from 9 p.m. Saturday, Dec. 1, to 9 p.m. Sunday, Dec. 2, in Student Innovation Hall in the University Services Center on the RIT campus.

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# WXXI 1370AM Radio: Interview with Bob Smith

[http://foss.rit.edu/media/WXXI-AM%201370%20\(am-hi\)%20-%20.wav](http://foss.rit.edu/media/WXXI-AM%201370%20(am-hi)%20-%20.wav)

The logo for WXXI, featuring a white 'W' followed by two orange 'X's and an orange 'I'.

**Go Public.**

*Home » Groups » 1370 Connection*

Random Hacks of Kindness

# YNN News Clip

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[http://foss.rit.edu/media/YNN\\_RHoK.mp4](http://foss.rit.edu/media/YNN_RHoK.mp4)

ROCHESTER



# Hacking For Humanity

# 13WHAM News Clip

[http://foss.rit.edu/media/13WHAM\\_RHoK.mp4](http://foss.rit.edu/media/13WHAM_RHoK.mp4)



# YNN Online Article

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Rochester



**YNN**

YOUR NEWS NOW.

12/01/2012 11:12 PM

## Hacks of Kindness Comes to Rochester

By: YNN Staff

Students at RIT took part in a global initiative with a twist, using technology to help solve problems through Hacking for Humanity.

The event is the fifth global event of Random Hacks of Kindness, an event that is made up of thousands of innovators in 30 countries.

RIT was a host site for the event where anyone could help develop solutions through technology that government, emergency responders and citizens can use to address common problems.

"A Hackathon is just coding and and marathon so we're going to be going for 24 hours here in The Center for Student Innovation at RIT," said Remy DeCausemaker, Research Associate for RIT. "Community members and students, industry folks are all going to be working together to solve problems for volunteer and aid workers around the world."

Global sponsors of Random Hacks of Kindness include NASA, Google, Microsoft and others.

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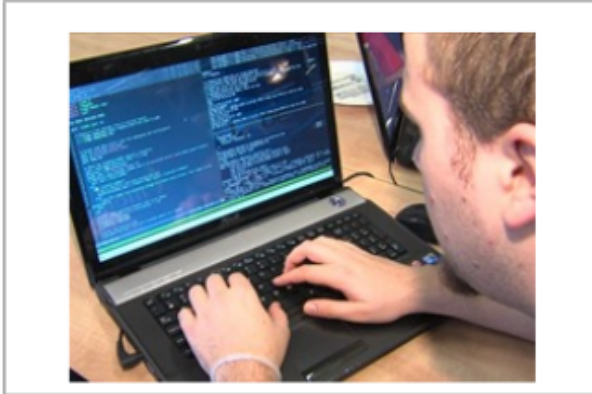


# 13WHAM Online Article

Random Hacks of Kindness

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## Random Hacks Of Kindness At RIT Addressing Complex Issues



Published: 12/02 6:45 pm

Updated: 12/02 7:02 pm

Henrietta, N.Y. – Students at Rochester Institute of Technology took part in Random Hacks of Kindness Global Hack-a-thon this weekend. The mission of the event is to create open source technology to address some of the world's most complex issues.

The Hackathon goes from 9 p.m. Saturday to 9 p.m. Sunday.

RIT's Student Innovation Hall is a host site for the event. The Hackathon is a global initiative made up of more than 5,500 developers, designers and artists in more than 30 countries.

At RIT, students are working on projects to help volunteers working in developing countries.

"We have everything going on from open hardware that pulls down radio signals and satellite data from NASA, to a tool that takes an SMS text message that someone in the field can send, it will automatically update a spreadsheet for accounting purposes because a lot of people in developing countries don't have a constant connection to the internet like we do here. So that's a great way to keep projects up to date, to account, and to help keep donors up to date with what field activities are happening," said RIT Research Associate Remy Decausemaker.

Decausemaker also made clear that there are a few local ties to some of the projects that students are working on.

"We have a project where we're going through all of the Henrietta town meeting minutes to make them searchable by keyword, and to turn the PDFs into machine-readable text," he said. "We want to do that for other parts of Rochester as well."

Students are working with state, federal, and international organizations. Currently, a mobile website for Gov. Andrew Cuomo's storm resources page is in the prototype stage and needs improvements before it can be used.

Also in attendance at the event was Sean Herron, a member of NASA's Open Government team, and Rob Bishop, a developer with the Raspberry Pi Foundation, a charitable organization founded with the goal of promoting the study of computer science and other related topics.



**seanherron**

Checking out the Google Games hackathon at RIT. They had three simultaneous hack days today! #rhok <http://t.co/Hq7W3lb3>

Dec 1st, 2012 at 3:25pm

Random Hacks of Kindness has hosted four global events to date.

# Democrat & Chronicle

Random Hacks of Kindness

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## 'Hackathon' offers solutions for dilemmas

Justin Murphy  
Staff writer

For a group of volunteers doing important international philanthropy, the programmers huddled around laptops at Rochester Institute of Technology Sunday were strangely silent.

There was some typing and an occasional whispered conversation in the inscrutable language of computer coding, but mostly the good work — projects that could benefit millions of people locally and around the world — was done in perfect silence.

Empty pizza boxes and two-liter bottles of Mountain Dew paid a messy test-



Coffie



DeCausemaker

ament to the programmers' 24 hours of work as part of Random Hacks of Kindness, a 6-year-old international programming event that had its first Rochester offshoot this year.

The concept is to apply computer ex-

perts' talents to specific, pressing problems that nonprofits and other public-minded organizations face. Participants select a dilemma and try to solve it in a highly caffeinated, non-stop, 24-hour 'hackathon.'

"The term 'hacker' has sort of a negative connotation these days," said Remy DeCausemaker, a research associate at RIT's Lab for Technological Literacy and one of the hackathon's organizers. "We're trying to reclaim the title. 'Hacker' just means creator, or problem solver, as far as we're concerned."

The Rochester hackers — about 50

See HACKERS, Page 4B

## Hackers

Continued from Page 1B

students, professors and community members — tackled half a dozen problems in small groups. Some worked on Monroe Minutes, a project by Hacks/Hackers Rochester that indexes meeting minutes from local public meetings by topic in a searchable database. Others created a text message-based system whereby Peace Corps volunteers in remote locations can input accounting data to spreadsheets when they don't

have access to a computer, saving travel time.

The largest group was working on a mobile version of New York's disaster preparedness website. The state realized when Post-Tropical Storm Sandy hit that most people were accessing that information on their cellphones, where the site was more difficult to use.

Since 9 p.m. Saturday, two teams of programmers created a mobile version of the site that will be returned to the state free of charge. No lengthy and expensive bidding process, no months of waiting for a

finished product.

"This isn't just for the future," said Brian Moyer of StormFrog, a Victor mobile technology company. "There are still people downstate who don't have services."

The work done at RIT's hackathon will remain open-source, meaning other programmers can use it or adapt it to their own projects.

For second-year RIT student Caleb Coffie, the hackathon was his first. He worked on the text-messaging accounting system, which was mostly functional by 5 p.m.

"It was surprising to actually get something working out of this," he said. "It was nice to see you can help someone in the real world with programming."

JMURPHY17@DemocratandChronicle.com  
Twitter.com/CitizenMurphy



## REPORTERONLINE

## What it Means to Be a Hacker

by David Utt

<http://www.reportermag.com/article/2926>

12.14.2012 | News

Sitting slightly in front of their computers programing, coding and designing the night and day away, the hackers gathered here are slowly changing the world with every passing hour. This is the Random Hacks of Kindness event (RHoK). The event is founded on concepts such as goodwill and charity. As Remy DeCausemaker, Research Associate for the CIS/IGM Lab for Technological Literacy and event coordinator of RHoK, says, "We're here to take back the hacker name as a creative problem solver." Here, they are hacking the world for a better tomorrow.



Max Hautaniemi

RHoK has one objective: to help create a collection of applications to help non-profits in 24 hours. These projects range from helping members of the Peace Corps with an SMS ledger system that tracks member's whereabouts, a Hurricane Sandy mobile app and language lesson generators. These apps were possible in such a short time span, as RIT students were not working alone. As part of a satellite event, it is scheduled as a single 24-hour block so the 20 or so students here in Rochester would work in tandem with the other RHoK events across the globe. This includes over 5,000 hackers in over 30 countries: Spain, Britain, Uganda, Nairobi, Brazil, India and Australia just to name a few. This allows RIT's small contingent to work in real-time with a multitude of hackers, with each adding their own innovations to these global problems.

Since the initial RHoK hackathon in San Francisco, the event has grown not only in the amount of participants but also in recognition by larger corporations and agencies such as Microsoft, Yahoo, Google, World Bank and NASA. One member of these organizations, Sean Herron, is the technology strategist for NASA's Open Government team, a division of NASA that works with the public to help find solutions to research and technology problems that impact human health and performance in short and long duration human spaceflight.

When asked about how a major government body such as NASA got involved with RHoK, Herron found that what students here are doing correlates greatly with what he and the other NASA employees are doing back in Washington D.C. In one way, the Apollo 13 explosion was the first case of a hackathon, "where a group of engineers, scientist and programmers from Houston with a limited amount of time had to solve a very important problem". Additionally the work NASA's Open Government team is trying to find solutions in problems of short and long term human spaceflight, many of those same issues are the same ones RhoK participants are trying to solve for third world countries.

Participants Andrew Fallows, a fifth year Software Engineering student, and Caleb Coffie, a second year Information Science and Forensics major, found the hackathon to have a much larger impact on themselves than they first assumed. While first going in with no real idea of what they could contribute, they noted they noted that whatever would come about, "It's not about making money or something to put on the resume, but about making a difference." Fallows and Coffie had developed the framework of a full working Peace Corps SMS ledger.

RHoK allows RIT students to take a break from worrying about career-oriented schedules and lifestyles and use the skills they've learned to make a real difference in the worldwide community. This is not just band of programmers and coders as the name might imply, but about being a creative problem solver. Those who are designers, illustrators, journalists and analysts all have the abilities to contribute to the cause. When January 18 arrives, RHoK will return for the American Greeting hackathon.

For more information on RHoK, check out <http://rhok.org>



## WHAT IT MEANS TO BE A HACKER

by David Utt | photograph by Max Hautaniemi

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# Outcomes

Projects Developed  
MultiSource Source Code  
Visualization

# RadioBird

A project using a commodity radio antenna hooked up to a Raspberry Pi that creates a Software defined radio. Can be used to tap into a number of frequencies, including transmissions from NASA Satellites

Source Code:

<https://github.com/skykooler/radiobird>

# Outages

A live map of power outages in the North Eastern US, based on data feeds from National Grid and other Power Companies.

Source Code:

<https://github.com/gregjurman/outages>

# Peacestagram

A webapp that shows a gallery of all the instatgram photos of PeaceCorps volunteers around the world, by searching for pictures tagged with terms like "PeaceCorps," or the names of Host Countries.

Source Code:

<https://github.com/seanherron/peacestagram>

# Monroe Minutes

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Tools to scrape websites within Monroe County and pull meeting minutes and other important documents from various village, town, city, and county websites, and convert them to machine-readable text. These are then indexed using a histogram method with keyword rejection via a black list of common words to exclude from results.

Source Code:

<https://github.com/thequbit/monroeminutes>

# RHoK-Media

A repository of art and design assets such as wallpapers, badges, and PowerPoint templates, based on the Random Hacks of Kindness logos and color palette.

Source Code:

<https://github.com/JennX/RHoK-Media>

# PNC Notify

A project to notify expecting mothers with health prenatal care information during their pregnancy over SMS.

Source Code (Deleted):

[https://github.com/adamhayes/pnc\\_notify](https://github.com/adamhayes/pnc_notify)

# SMS-to-Spreadsheet

Web application to allow users to send SMS messages to a designated phone number, and the contents of the message will be parsed and used to update a spreadsheet.

Source Code:

[https://github.com/kaldrenon/sms\\_to\\_spreadsheet](https://github.com/kaldrenon/sms_to_spreadsheet)



# Hurricane Sandy Relief

A mobile storm resources site to accompany <http://governor.ny.gov/storm-resources> that will:

- 1) aggregate all of the disparate data into one comprehensive data source, and
- 2) provide a mobile view of the information from the Governor's website, using Drupal as the underlying content management system

Source Code:

<https://github.com/stormfrog/hurricane-sandy-relief>

# Random Hacks of Kindness: Four years of Hacking for Humanity

Multi-Source Source Code  
Visualization

# Next Steps

The Capstone Report  
The Visualization  
The Projects

# For the Capstone Report

Publish on Github.com

Publish as a guide/resource/narrative on  
RhoK.org

Publish a Feature-Length Article for  
Opensource.com?

Publish as part of a collection of Essays?  
Maybe chapter of a book?

# For the Multi-Source Visualization

Release rendered video on  
Youtube.com

Link to video on RhoK.org

Release log generation/colorization  
scripts on Github.com

# For The Projects

*Hacking for Humanity*

Random Hacks of Kindness

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Each repository publicly available and ready for contributors.

Run RhoK Hackathon again in December.

## SMS-To-Spreadsheet

- part of an ongoing effort--between our lab, and the PeaceCorps Special Assistant to the Director of Innovation--to test and possibly deploy in the field with active PeaceCorps Volunteers (PCVs)

# What I'd Like to See Happen?

The story being told--on the sites mentioned prior, and elsewhere.

- increase in number of local participants

- increase in project awareness and activity

  - more press, more contributors, etc...

- increase in awareness and publicity of RHoK Organization world-wide.

- increase in new projects (both technical and non-technical) built at future events.

# After the MS degree?

- Continue “Being the Change” at the new RIT MAGIC Center—<http://magic.rit.edu>
- Continue to research and develop HF0SS projects
- Begin teaching Humanitarian Free/Open Source Software Development (HF0SS) course at RIT
  - 16 students already registered!
- Help RIT build the first Minor in Humanitarian Free/Open Source software development in the USA



# Lessons Learned

What went right

What I would do differently

Advice to future students

# What Went Right?

Hacking for Humanity

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## The Hackathon itself

50ish attendees creating or improving 8 projects

## The Gource Visualization

It sure is pretty

## The Press--Definitely the Press

2 Television News Casts

1 Radio Interview

7 write-ups, both online and print

# What you would do differently?

## Connect with Other Sites

Work together with other cities  
Video Conferencing/Broadcasting

## Draw a more diverse crowd

More creative/design folks  
More non-student attendees  
More Female attendees  
More local companies

# Advice to future Capstone students?

Do something you truly enjoy

Pick something that is already part of  
your professional life

Do something “BIGGER” than just a  
paper; have a cause, make a difference!

Talk to and work with as many people as  
you can before/during/after to help you  
prepare, promote, and celebrate your  
Capstone!

To the hackers who contributed to:  
Gource and MultiGource

<https://code.google.com/p/gource/people/list>

<https://github.com/Frencil/MultiGource>

LibreOffice Writer and Impress

<https://www.libreoffice.org/aboutus/credits/>

# THANK YOU

To Dr. Sam McQuade, who challenged me to be the best student I could be and gave me the opportunity to do so.

To Abby Berner, now Abby Cantwell, is the reason why I was able to make it through my first degree, and without which a second would not have been possible.

To the RIT Center for Multidisciplinary Studies, who's support and guidance has provided me with the opportunity to make my life's work, and my academic experience one and the same.

# Obligatory Shout-out to my Boss (and also Capstone Mentor)

To Professor Stephen Jacobs for  
always treating me as a colleague,  
and for his whole-hearted support of  
my research and professional  
development.

# Red Hat & Fedora

To the members of the Fedora Team, Opensource.com, and Red Hat, who have had our lab's back since Day zero.

In particular, Tom Callaway, Luke Macken, Ralph Bean, Ruth Suehle, Leslie Hawthorn, Dave Malcolm, Tohsio Kuratomi, and Mo Duffy.



# Our .Gov Friends

Jim Bell, Ken Zalewski, Dean Hill, Graylin Kim, Dan Pozzi, and the NYSenate.gov development team (both past and present)

The office of ITS-OFT and the volunteers who organize CapitolCampNY, and work with many agencies and branches to bring the Open Source Way to the Great State of New York.

Special thanks to Ginger Gericitano for going above and beyond her duty to be involved with RHoK Rochester.

# The F0SSBox

To the F0SSBox and its hackers.

Nathaniel Case, Justin Lewis, Ryan Brown, Sam Lucidi, Ross Dellinger, Chris Lockfort, Andres Ruiz, Matt Soucy, Luis Rosario, Duy Nguyen, Jenn Kotler, David Gay, Greg Jurman, Tim Duffy, David Silverman, Kevin Hockey, JT Mengel, Fran Rogers, and

Anyone else in the commit logs at  
<http://github.com/F0SSRIT>

# The RHoKStars

Thea Aldritch, and the other members of the Random Hacks of Kindness organizing team.

The RhoK Global Sponsors.

Sean Herron, for being a speaker, and for getting the NASA Space Apps Challenge on my radar. We look forward to many more events like this at RIT.

Rob Bishop and the Raspberry Pi Foundation, for supporting Open Hardware on a global scale, and for bringing that presence to our local event.

The RhoK Rochester volunteers and attendees. No amount of planning or sponsorship will do much to help without all of your hard work.

Brian Moyer, Karthik Balasubramanian, and StormFrog's ace crew of developers and designers who pulled an extra 9-5 shift, then an extra 5-9 shift, on a weekend, to help us help others.

# The Professors

Prof. Cameron

Prof. Cooper

Prof. Foltz

Prof. Worrell

Prof. Johnson

Prof. Sutton

Prof. Schull

Prof. Lundgren

Prof. Sherrill

Prof. Shein

Prof. Fornieri

Prof. House

# The Admins and Staff

Clare Lagiewski

Jill Bray

Brenda  
Schlageter

Ann Dilal

Kim Shearer

Jenn Hinton

# My Partner

And finally, Marie Nordin, for her  
patience and support through my  
entire Graduate School experience.

Particularly the patience.

And the love.

...But mostly the patience.

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