

BioMap for Amanda

Problem owner name

Nina Ginsberg

Problem title

BioMap

What is the problem you want to solve?

Currently, there are many personalized tech devices (such as Fitbits) being used to monitor and track health. These devices can be beneficial in motivating, documenting and sharing aspects of health, but their functionality suggests that health, exercise and the environment are individual and separate components of health and daily life activities. Although useful to a point, these products undermine a greater understanding of health as holistic, intra-related and complex. There are three main drawbacks of current devices; the scope and functionality is usually limited to one aspect of health (i.e. steps per day/cardio), data is not easily shared with health professionals (personalized apps) and very few devices take into account the impact of wider environmental determinates (i.e. beyond GPS, altitude). What is needed is a solution that seamlessly integrates already available personal health metrics (HR, exercise output, GPS, sleep) with other environmental determinates, like seasonal weather patterns, wind, temperature, terrain, light, humidity, sweat, hormones and sugar levels and other corporeal/embodied sensations.

My PhD research explores how bicycles feature in rural Africa girls' access to education. I am most interested in the embodied, geographical and environmental conditions that girls experience every day when riding a bike to get to school and home. Previous educational research focuses heavily on cultural, economic and structural interrogations of girls' schooling and education, but few take into account what it is like to actually get to and from school.

To achieve this, I would like to collaborate with other to build a dashboard called BioMap. I see BioMap as a way to combine a range of biometric, sensory, health, geographic and environmental overlays into one single, easy-to-use, interactive data visualization. The display includes a map of Africa that can be zoomed in and out of and different overlays can be turn on and off. BioMap is needed to show the complex, interrelated and unique environmental and bodily forces that local girls contend with as they make their school journeys on bikes. This solution will be an invaluable and original contribution to expanding current understandings of the local conditions these girls travel through.

I feel this would be reusable for other researchers and other people interested in their health biometrics.

Why do you want to solve this problem?

Contextualizing and situating the conditions of riding a bicycle through a particular environment will better enable researchers and individuals to understand a fuller picture of the emplaced body. This will enable quick identification of factors that far exceed the standard health assessment. The BioMap will help situate users to better

appreciate the 'broader picture' and consider more widely the elements that support or deter a person as they move through a specific environment.

One of my motivations to participate in Health Hack is to collaboratively build and share a solution that will encourage researchers, developers and educators to think more divergently, holistically and critically about the materiality of the contexts in which they are working.

That is why I think an Open Source dashboard would be the most generative, useful and realistic output for this Health Hack.

I am interested to see how Health Hack programmers might go about doing this, for example, is it best to get APIs that can read from devices such as Fitbits, Garmin, weather and other sources and then plug it into something like R and python that will give us the ability to make our own using R and Python.

The team may want to make it themselves or use something that plugs into an Open Source Dashboard software if available. Any integrations or code for this project should be open source with attribution to the authors via Github.

Conversely, there might be a different configuration the team might like to try depending on time, interest, skills or if there is other software, suggestions or ideas people have in mind that would fit.

What do you envision as the ideal solution for this problem?

I would like a platform created that shows a range of environmental and situational factors, so that I can show the conditions that these girls (or others) experience as they travel. I envisage BioMap as being a dashboard that combines a range of biometric, sensory, health, geographic and environmental overlays into one single, easy-to-use, interactive data visualization.

BioMap is a dashboard platform that combines a range of biological, sensory and environmental data so that users can not only explore each dataset individually, but can also shift between, and overlay different indicators to see how each influences the health of the person as a whole.

What sort of Open Source solution do you think can be created in 48 hours, by a small team of developers, designers and data analysts?

I am keen work with others on establishing a prototype interface that integrates a range of health, biometric, geographical, environmental and embodied sensory data. Principally, I would like a way to get the data from the sensors I am going to use (GoPro, Cronos, Fitbit, Google Maps, etc) into a data table (excel or .csv) and see if there is some way to synthesis this information.

Any extra work that could be done to achieved this would be an added and welcome bonus. For example, given the time (and if we have a crack team), it would be awesome to get a dashboard that includes a map of Africa that can be zoomed in and out of where I could turn different overlays on and off.

My initial conceptualisation is to use a map (i.e. of Africa via Google Maps) which can be zoomed into and out of, with a box on the side panel that has the other trip indicators/overlays. When you click on each one, you can select whether you wish to view it by itself, or you can overlay (or layer up) on the map so you can trace indices of for example; place (GPS, altitude, distance), space (video footage, pace, timing), environment (weather, air, and terrain) and body (HR, exercise, etc) changes while the body is undertaking daily routines and activities such as travelling to and from school.

Keeping in mind Health Hack has a set amount of time, the output I am most keen to achieve is a dashboard (map) that overlays APIs datasets from the biometric devices/sources. Depending on time, skill and interest, I would be very happy to explore any other add-ons, extensions or ideas the team might have.

As an extra bonus, I have a popular blog called Bicycles Create Change which has over 180,000 readers locally and internationally. I will use to showcase and promote this output and its creators. The blog has many academic and industry followers (transport, infrastructure, geography, health, education, engineering, policy) who would be very interested in seeing this project. Aside from including aspects of this solution in my own research, I will also actively promote and attribute the team (and the solution) via my blog, through any funding submissions and in any associated events, media and public engagements I undertake. This means significant exposure for the people working on this team far beyond just Health Hack.

Are there datasets or people with domain knowledge that you will be bringing to work with? What/who are they?

Yes. I will be bringing all of my own biometric datasets to populate BioMap including data from these sensor/devices: Cronos, My Hormone Calendar, Garmin, Cronometer and Fitbit, This will provide datasets on my sleep, activity output, heart rate, duration, nutrition, menses, altitude, distance, speed, time/date, barometer, temperature, calories, recovery rate and other general personalized biometrics. I will also be using a Go Pro for A/V footage. I am keen to also see how we can integrate/overlap other open access data such as BOM weather reports (wind, UV) and Google Maps and any other data elements that are easily accessible like local event calendars, sun rise/set, smog reports or other suggestions from the team.

Please note, only my own biometric data will be collected and published at any time.

What are the current solutions for handling this problem?

There are a range of devices (Garmin, Go Pro, Fitbit, and health apps) that cover certain aspects of health (some more comprehensively than others), however few devices integrate a range of situated and environmental data from a range of sources/sensors.

Summary for website

PROBLEM

My PhD research explores how bicycles can enable or constrain rural Africa girls' access to education. Many girls are finding ways to cope with living in a gendered mobility crisis

shaped by severe poverty, cultural restrictions and rural isolation and being able to use a bicycle can be a way of getting more quickly and safely to school. However, there are physical, geographical and climatic limitations to this. Unlike other educational research that focuses on socio-cultural, policy or pedagogy interventions, the central focus for my project is the bicycle itself and the materiality of riding to and from school. This means paying close attention to the locally situated 'emplaced' minutiae. Part of my fieldwork includes undertaking a school-to-home bicycle ride in order to capture, explore and interrogate the various material, embodied, affective and environmental elements that co-create a local school ride experience. I am using a range of health, biometric and geographical sensors/devices to track and monitor this experience. The challenge is how to best display and synthesis these (data) elements into a cohesive representation.

To achieve this, I would like to build a dashboard called BioMap. BioMap combines a range of biometric, sensory, health, geographic and environmental overlays into one single, easy-to-use, interactive data visualization. The display includes a map of Africa that can be zoomed in and out of and different overlays can be turn on and off. BioMap is needed to show the complex, interrelated and unique environmental and bodily forces that local girls contend with as they make their school journeys on bikes. This solution will be an invaluable and original contribution to expanding current understandings of the local conditions these girls travel through.