GeoFoto : Augmenting Tourist Experiences with Geo-Temporally Tagged Photos

GeoFoto is an application geared toward tourists and tourist groups. We want to leverage spatio-temporally tagged photos to augment user experiences using location aware mobile devices.

The idea is to provide mobile users with an interface allowing one to browse through collections of photos based on their current locations and their immediate vicinity. Our interactions shall provide incentives for varying user/tourist scenarios, including walkabouts, car trips, bus rides, or quite simply, killing the half hour extra you have to wait for your plane flight.

- Who are the users?
- Typically, tourists. We anticipate mobile device carrying users of all ages using our application as a time killer, typically when displaced from their principal areas of work and play.

- What tasks will the users need to perform?
- Navigation within a graphical UI; photo database browsing; selection and content consumption.

- What new tasks do they desire to perform?
- GeoFoto's users wish to scope out unknown locations, and decide where their next destinations lie. This can be as generic as '13 miles to the east' to as specific as '30 metres in the vicinity'.

- Our users shall hence determine what locations are potentially interesting based on visual cues, such as user tagged photo datasets.

- Where are the tasks performed?
- Typically, when in the possession of a mobile device and 'out and about', be it a walking trip, a car journey, or a bus ride.

- How are the tasks learned?
- Hands-on user experience.

- What set of tools does the user have now?
- Mobile, location aware devices, such as cell phones/PDAs running the JVM.
- We shall be providing users with a 'GeoFoto Kit' which includes a GPS and a digital compass. This is in anticipation of the integration of the same with next generation phones.

- How often do your users perform the tasks?
- Sporadically; GeoFoto is typically accessed at the time of a journey or a period of 'idle time'.

- What happens when things go wrong?
- We see the primary points of failure being in incorrect geo-location and corresponding misrepresented photo collections. We intend to provide a feature which allows the users to update geo-location or correct their positions at any given point by the means of an always-available user interface element, a 'Refresh' button, for example.

- What's the relationship between the user and his or her data?
- The user typically views photo sets captured by other users. GeoFoto primarily remains an exploratory tool, an application which lets you access unknown visual data based on location, and this can be done mainly by accessing unseen photosets.

- How do your users communicate with each other?

- We assume that each mobile device typically represents a single user, or a small group of users, typically determined by the ***kind*** of interaction that they have in common. For example, a car trip would mean a group of five people navigating and browsing on a single or upto five different devices. These numbers would be different for walking tourists, for example. For the 'idyllic productive' user, this number would be one.

- Their communications, again are determined by physical proximity. Typically, we see this communication as being mostly verbal, face to face, one to one/ one to many. This is due to the fundamental nature of the application itself; GeoFoto provides incentives for usage in physical social networks.

- With whom do they communicate?
- With people who share their 'tourist space'. Friends, family, tourist groups who decide on their interactions based on group decisions, et al.

Ideation:

Sketches are attached as PDFs and JPGs.

Evidence

Our idea provides a way for people to navigate photos based on knowing which way to travel. By letting users explore photos based on directionality, we are supporting the discovery instinct of users who want to explore the hypothetical scenario of ***what lies ahead***

Our intuition is supported by discussions of this idea with potential users; friends and dormmates. We believe that one of the fundamental characteristics defining a good idea is if your users begin describing the idea with the clause ,'you know what would be cool'. Of all the ideation lifecycles, this is the one which received maximum feedback.

Other systems which support similar tasks include:

Marc Davis's MMM project which supports taking photos and tagging them with a georeference and timestamp and uploading them to a central server. If we can, we would like to leverage this for the first part of the experience, so that we can focus on the viewing and visualizations of the already georeferenced photos.

Mor Naaman/WWMX involve visualizations of photos on desktop PCs. This isn't directly relevant, since handheld interactions are quite different, but we do want to take advantage of Mor's database of georeferenced photos of Stanford, so that we already have pictures to include in our system and provide for users on campus.

Dan Maynes-Aminzade also did work with distorting maps to consolidate viewing areas with georeferenced photos on PCs, however that's fairly removed from what we're focusing on.

Erik Blankinship did work on viewing historical, georeferenced photos. We're distancing ourselves from the historical photo viewing angle, but we notice he did incorporate a digital compass, which is something we have considered in order to facilitate being able to face one direction and zoom in and out directly.

Further Evidence

Discuss with Professor Klemmer, Brian, and Mor to confirm nothing like this has been done (according to Mor, nobody has really done ad hoc georeferenced photo viewing on cameraphones in general). We also plan to observe tourists at Stanford or in San Francisco and see how they currently decide what to visit next and how happy they are with their decisions afterward.

Evaluation Plan

One research question is how tourists' decisions and journeys are affected with the advent of this system, including whether they are better able to find interesting sites, and have a more enjoyable experience overall. We predict that the GeoFoto system will allow users to explore more casually in a go-with-the-flow sort of way, and discover lesser known but interesting sights along the way which they otherwise would not see.

This can be tested through some ethnographic/qualitative research observing tourists use GeoFoto (or not using the system, in the control group), logging their interactions with GeoFoto, and giving the users questionnaires before and after the experiment to get some quantitative data about affinity, difficulty of navigating, confusion, getting lost, etc. There will be about 4 dyads run through this.

Another question is whether the step size between blocks of photos is better as a fixed size, or increasing exponentially as you get further from you current location. We suspect that the former is better when travel is only walking/biking, whereas the latter is better when there is also driving involved.

This can be tested by running users in four groups, walking/biking with constant step size, walking/biking with exponential step size, walking/biking/driving with constant step size, walking/biking/driving with exponential step size. We can give them questionnaires and observe their behavior. We could have 2 dyads in each group.

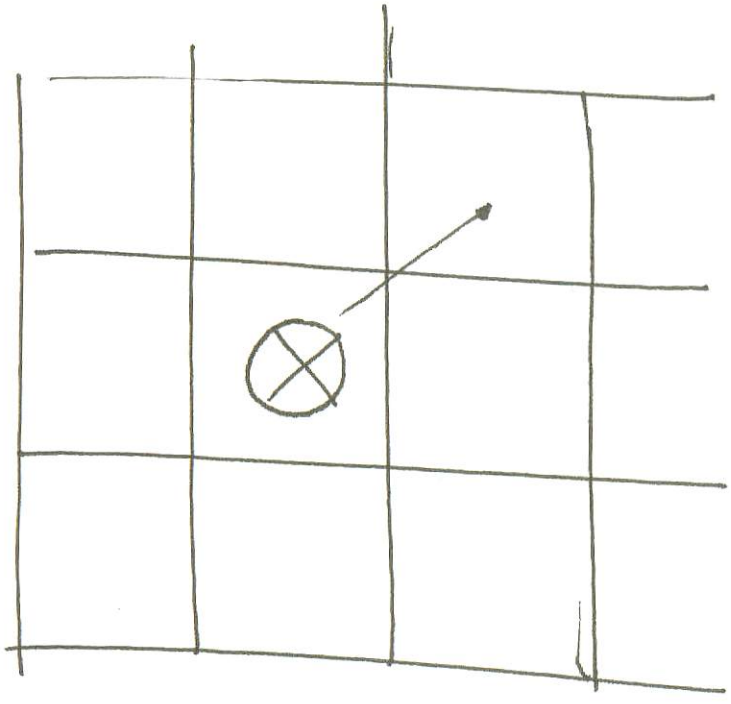
Note that we may only decide to do one of these experiments, as time permits.

$1 + 3 + 9 + 27$

$1 + 3^1 + 3^2 + 3^3 \quad \ldots\ldots + 3^{10}$

$\frac{(1-r^4)}{1-r} \qquad \frac{(1-r^{11})}{1-r}$

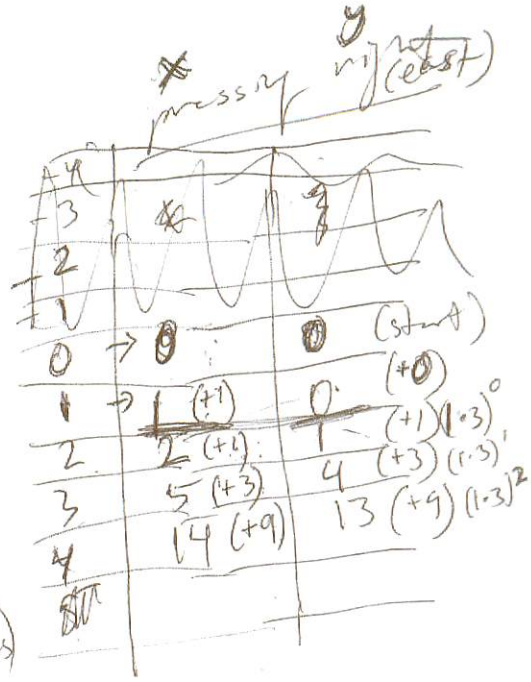
S_m



542 Alvarado Row

Lat: 37.4119666555 to 37.4319666555

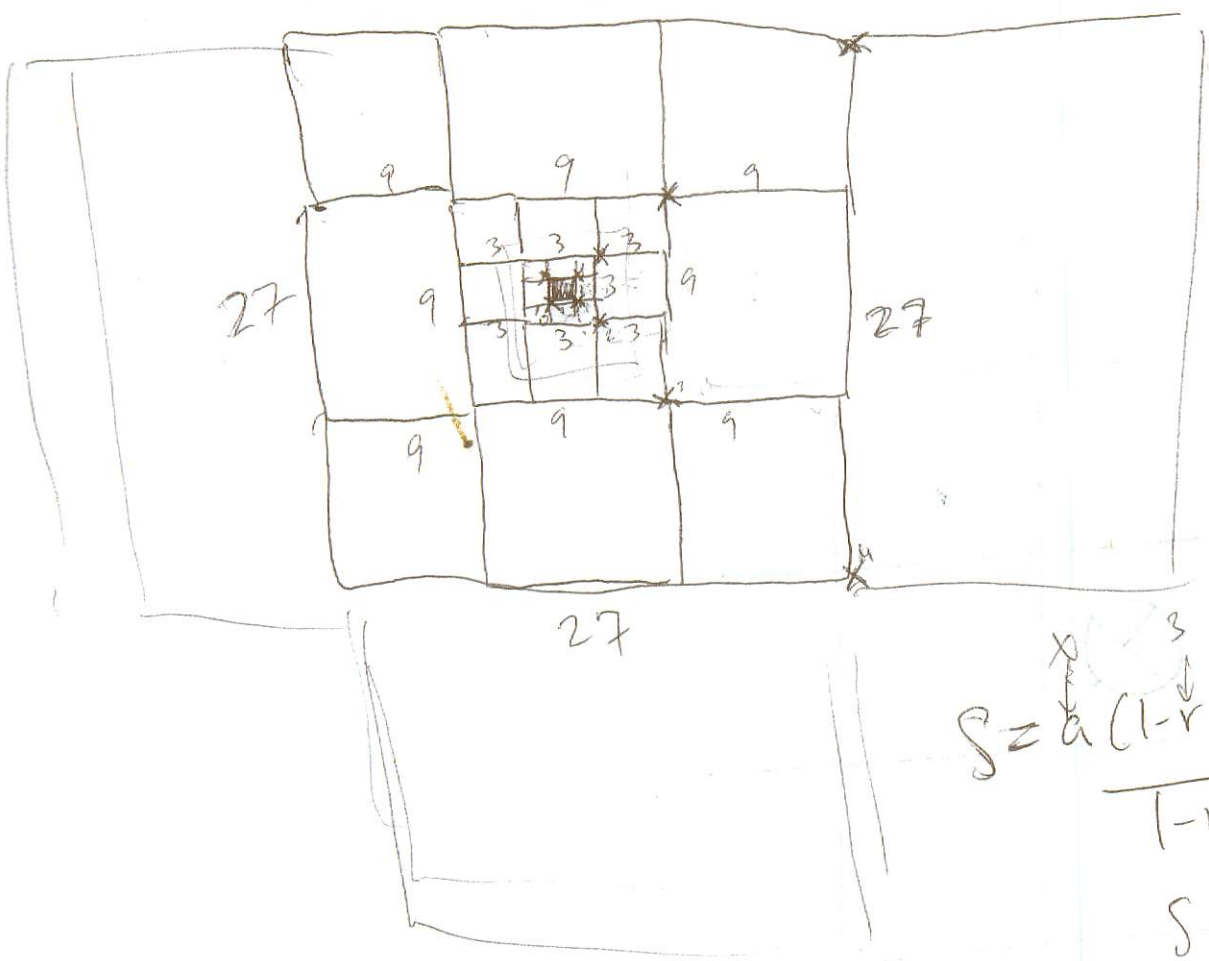
Long: -122.1755316 to -122.1553116



$x: \begin{matrix} 0:0 \\ 1:1 \\ \to 2: \end{matrix} 1 + 1\cdot\frac{(1-r^{(n-1)})}{1-r}$

(relative to corner)

$y: 0 + 0 + 1\cdot\frac{(1-r^{(n-1)})}{1-r}$



$0 + \underset{(1\cdot3)^0}{0}$

$3^0 + 3^1 + 3^2$

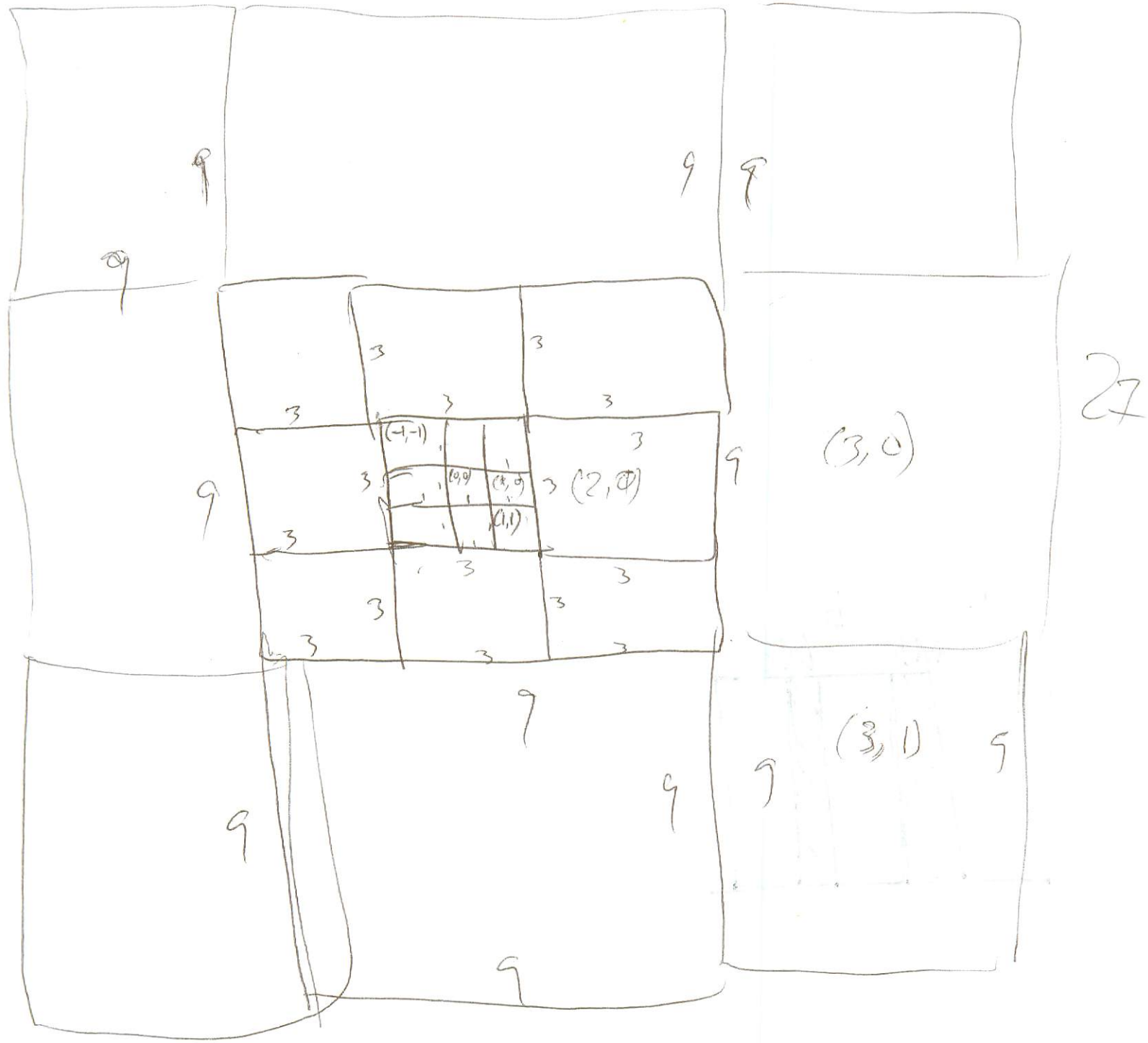
$(x)^0 + (3)^1 + (3x)^2$

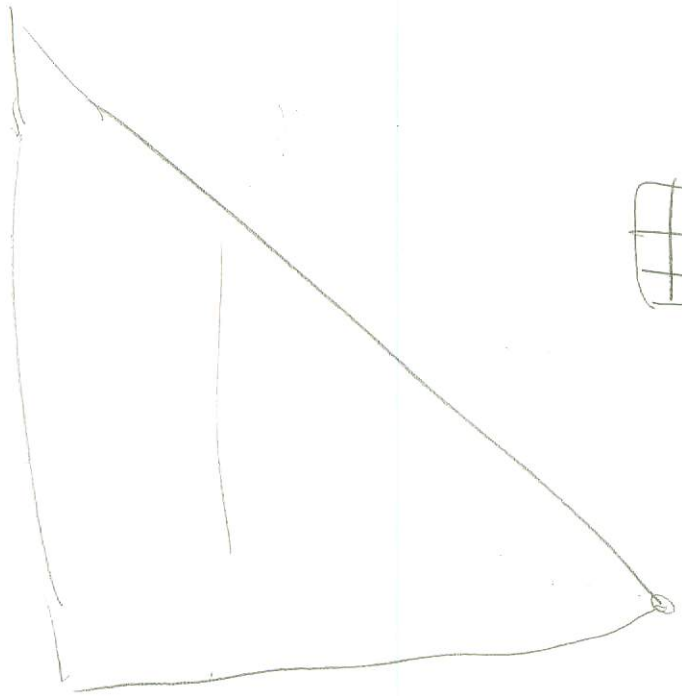
$S = \frac{a(1-r^n)}{1-r}$

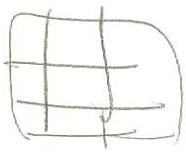
S is the sum
a is the 1st elem
r is the ratio
n is # of elements

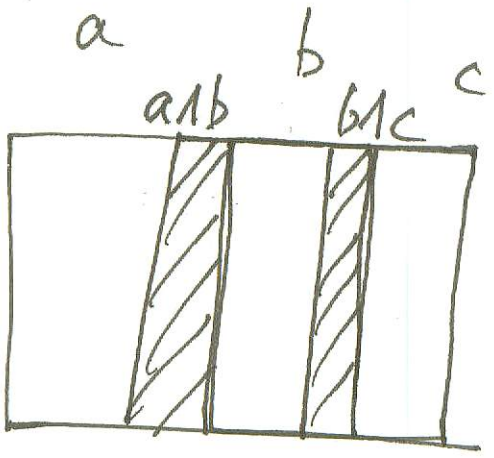
$1\cdot\frac{(1-3^1)}{1-3} = 1$

- web browser-like style? back/forward
- block jumps relative to current location


(-1,-1)
(0,0)
(1,0)
(2,0)
(1,1)
(3,0)
(3,1)
27






a
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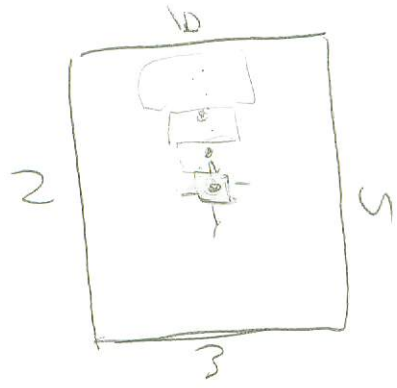
c
a∩b
b∩c


D
2
5
3

CS 377 5/6/05

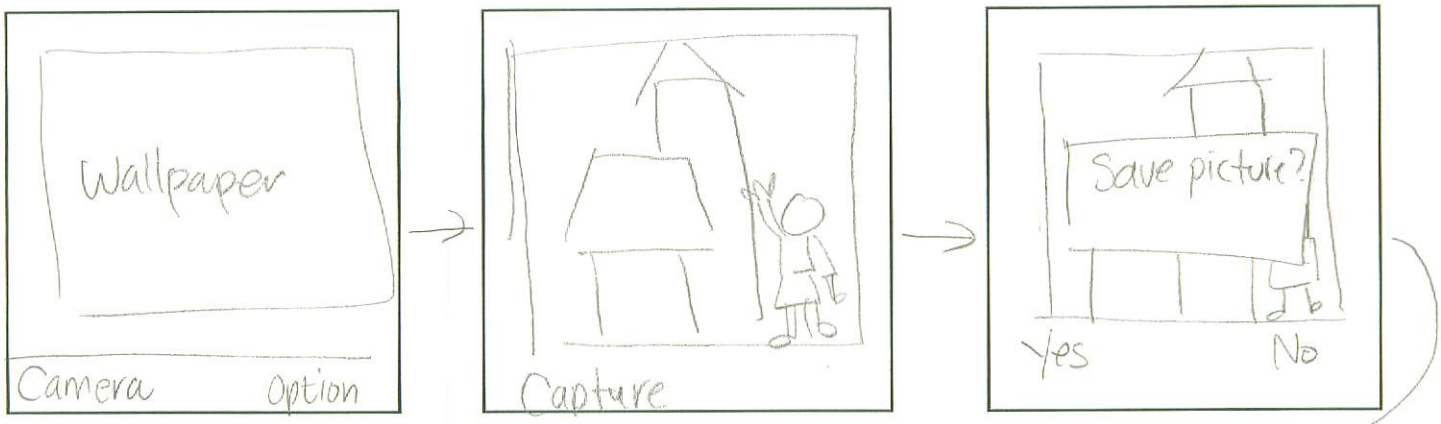
- Location awareness
- DO something w/ current time + location
- Immerse in collective mind
- What happened in the past at this location
- Nostalgic value, memory associated
- ~~Zoom in~~ childhood memory

HBD
- ~~More information about a place~~
- Pictures other ppl are taking in other place
- ~~Collaborative filtering~~ | facebook w/ pictures
- collaborative art
- Ppl jump up at the same time

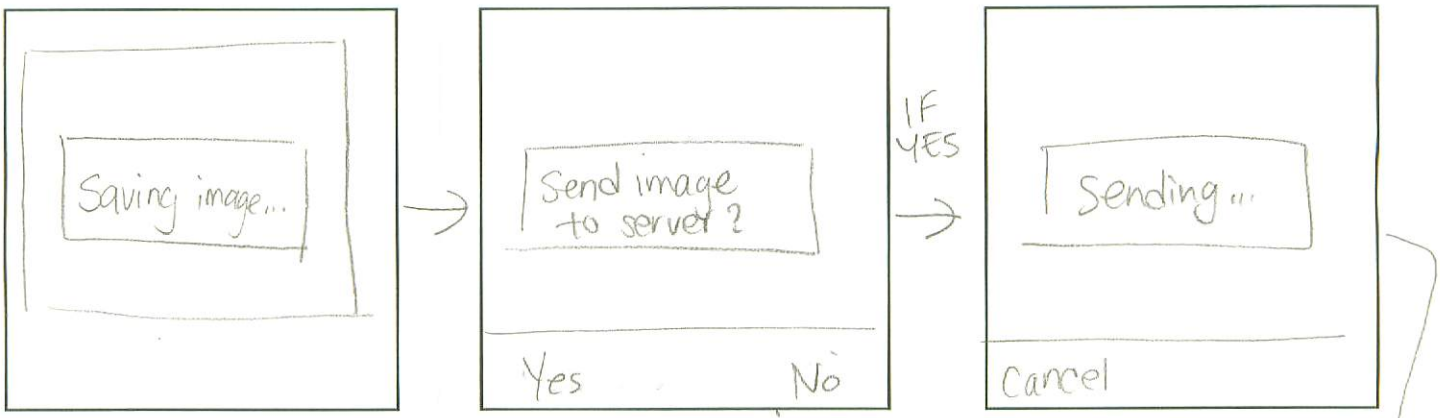
W+H?
- Ppl takes picture ~~of~~ at the same time
- Spying – for evidence / criminal investigation
- ~~Guide~~ Guide of what to do next.
- 2 hrs – White Plaza – recommend where to go.
- Flash mock-up.

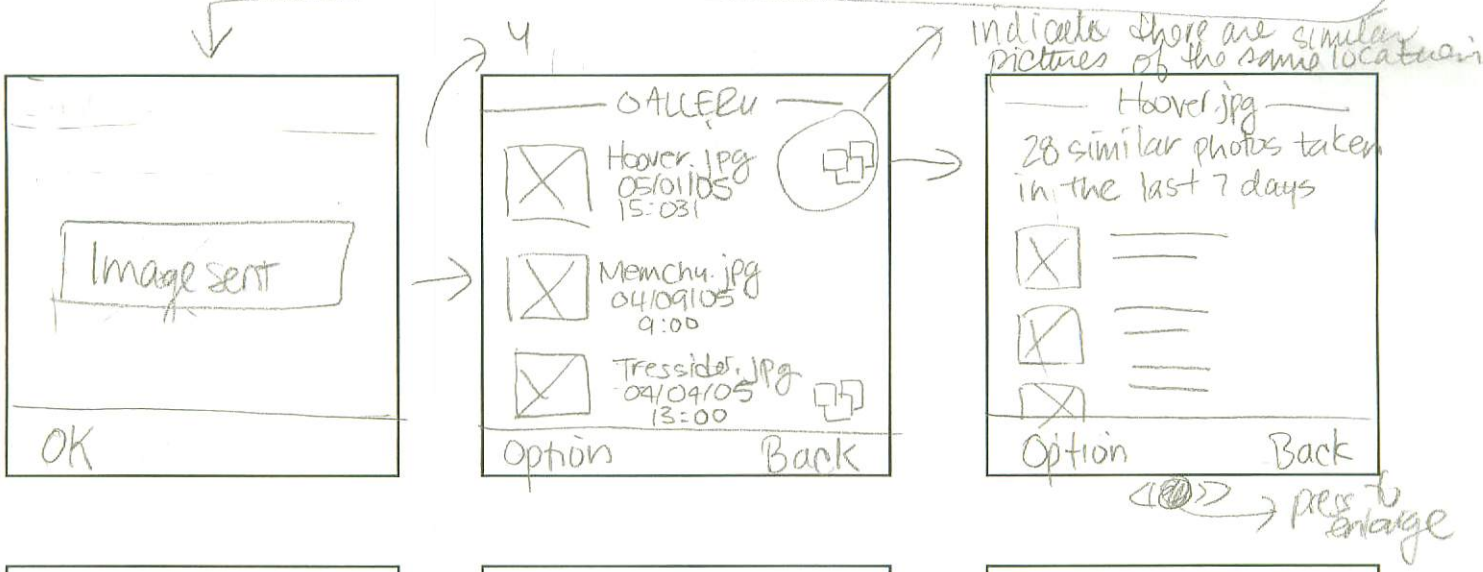
With
- Micro-level pictures – auto stich
- Vertical auto stitch
- Weird photo – lap photo, trash can
  - daily food – idea of things to make
  - mental narrative
- Hot or not for cellphone

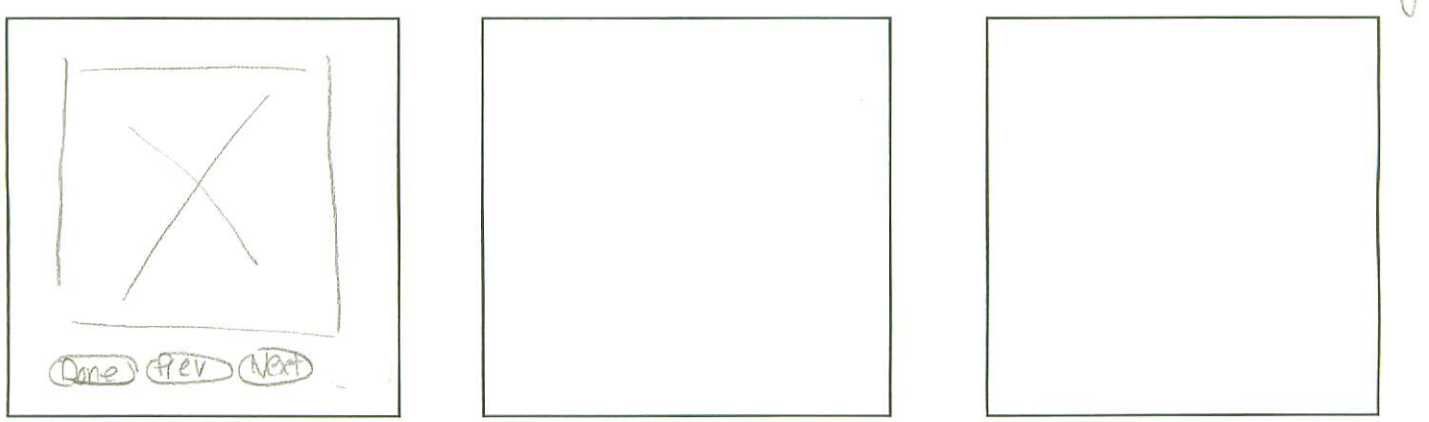
PhotoMap 5/2/05



IF YES

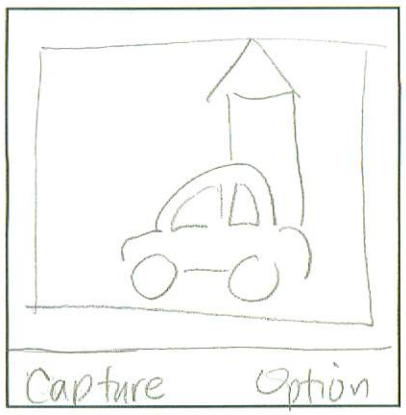


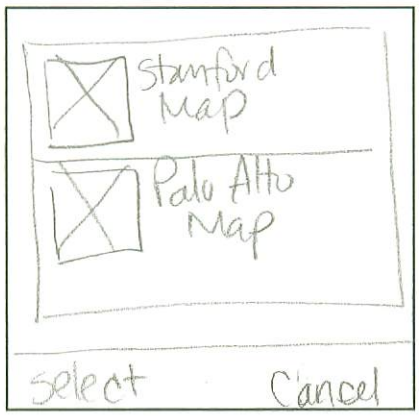


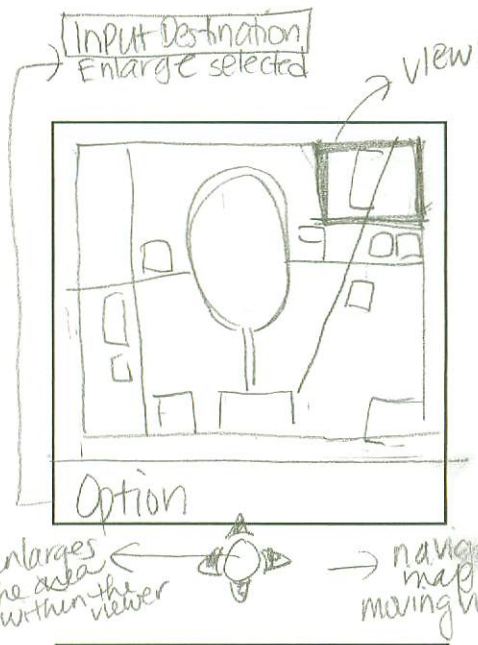


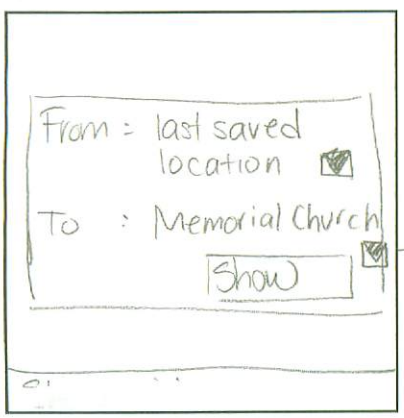
Follow the Dog

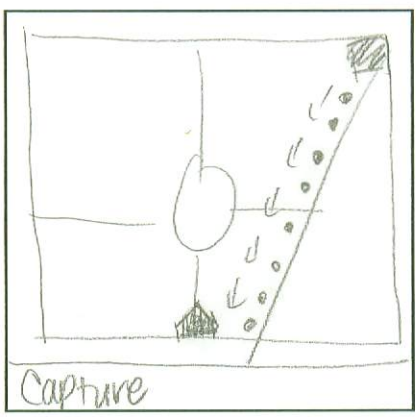
05/02/05

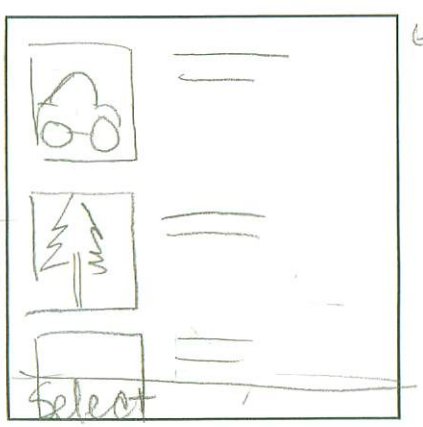


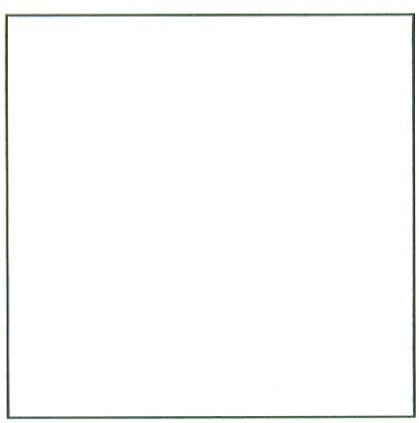


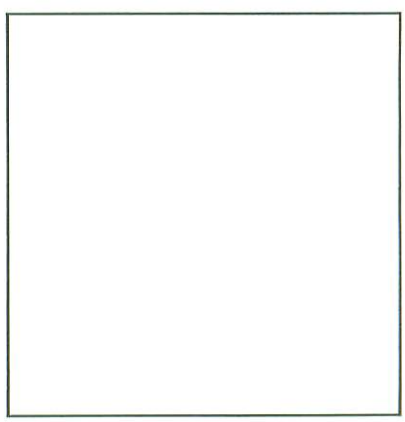


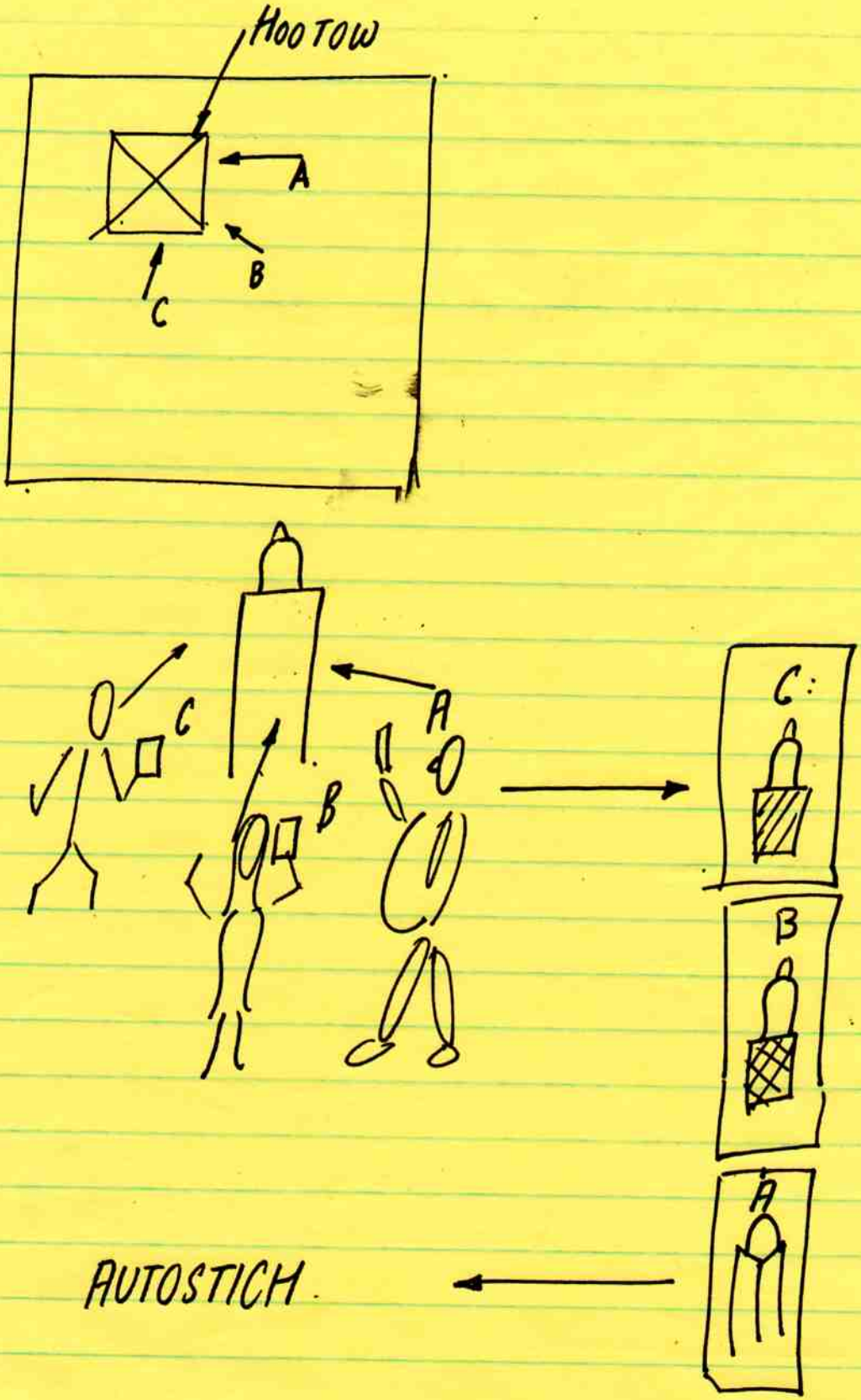


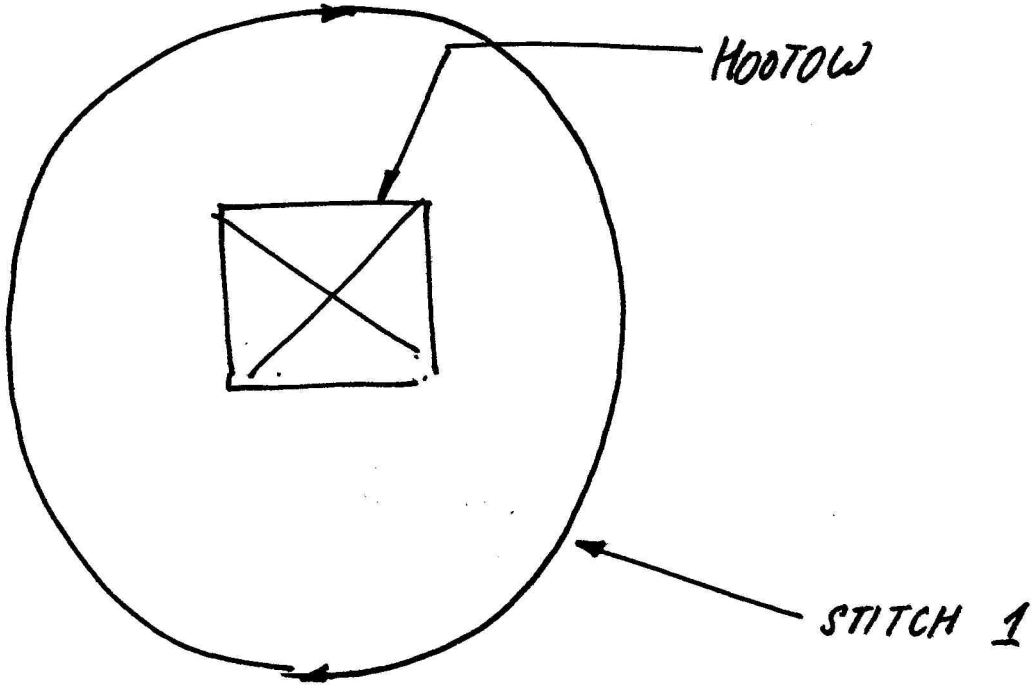


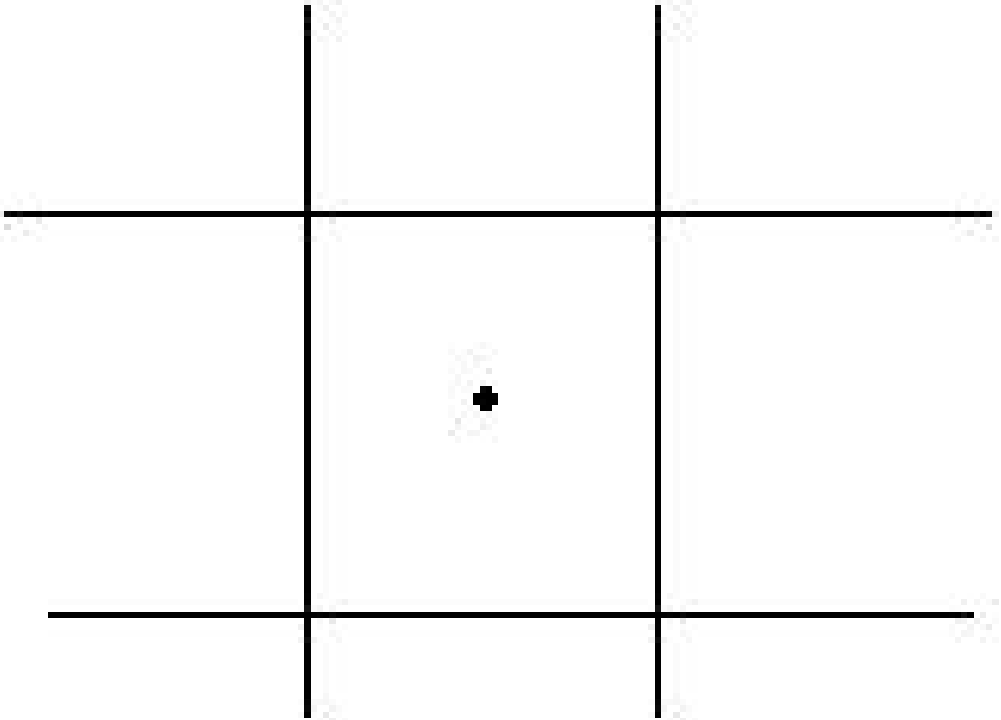







HOOTOW
A
B
C
C
B
A
C
B
A
AUTOSTICH.


HOOTOW
STITCH 1



① Marc Davis's work → get in touch ✓.
how do we leverage?

② Bluetooth → got it synced → receivers → HARTTT
↳ what now?

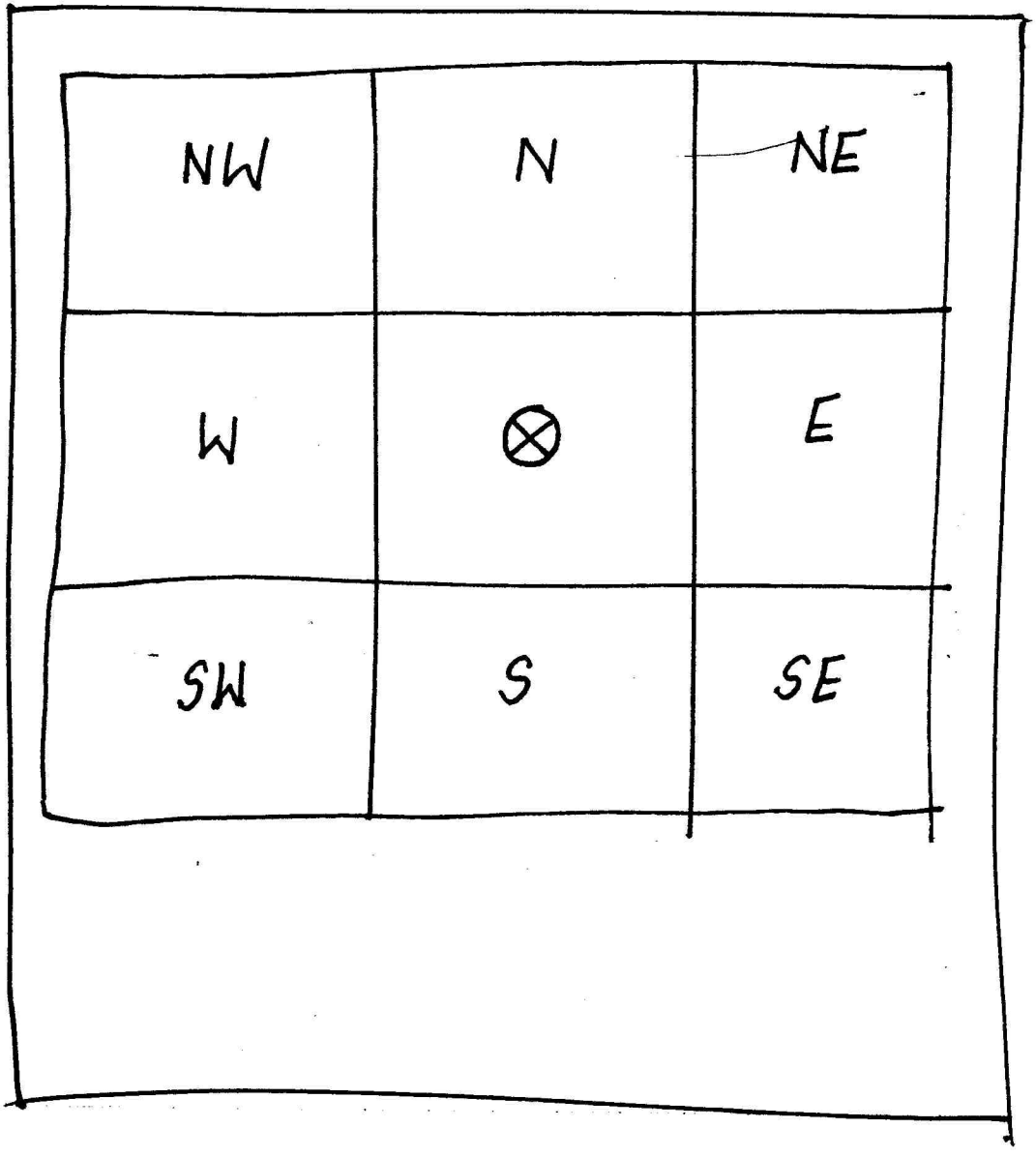
③ Interactions → Time Lapse
↳ Autostitch.

Placelab
mailing
↳ 7610.
↳ wwmx.
↳ stitch

ERIC Blankenship.
RFID.

Tourist Blankenship.

GPS
Hypothesis.



Naviga"

via

NOKIA

7610

'NAVI PAD'

0: 'REFRESH'

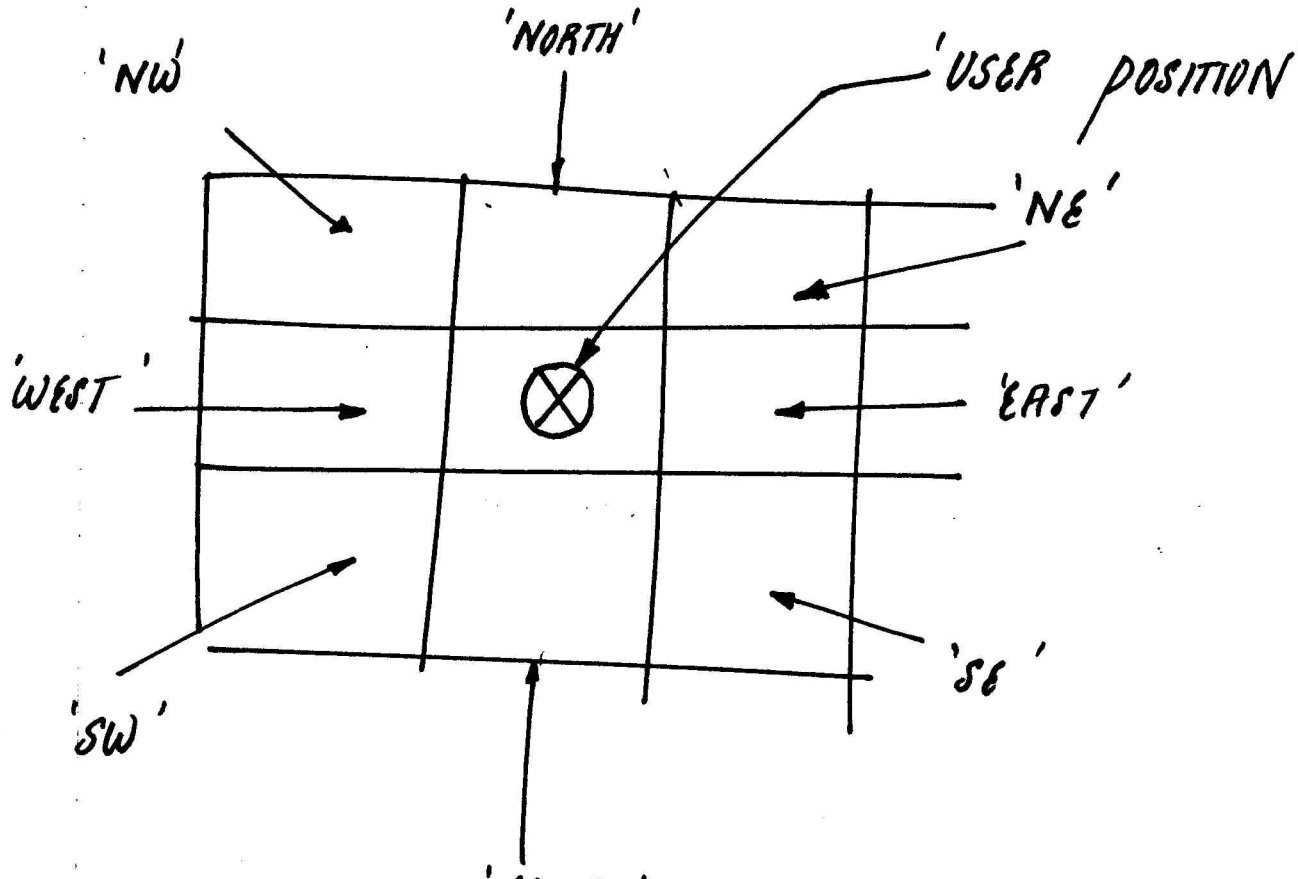
IN TABBED MODE.

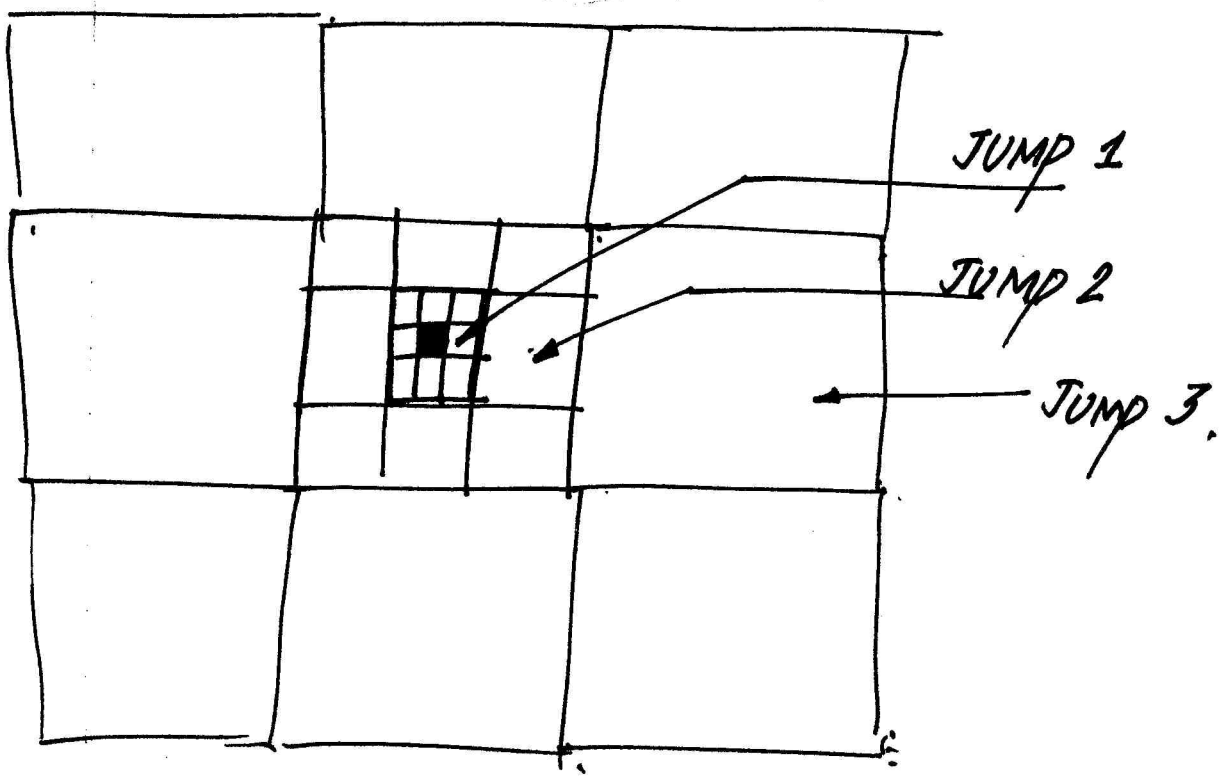
BACK.

GEOFOTO

UI.

GEOFOTO.


'NW'
'NORTH'
'USER POSITION'
'NE'
'WEST'
'EAST'
'SW'
'SE'
'SOUTH'


JUMP 1
JUMP 2
JUMP 3.