Bay Area Surveillance Project

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Also supported by work of Shazeda Ahmed and Emily Witt who are part of the team working on the CTSP fellowship project with Steve and Peter.

Project goals

The goal of this project is to inform Bay Area residents of the of the surveillance capabilities of local governments and the scope of personal information that can be collected by surveillance equipment used by local law enforcement agencies. We wanted to create an interactive informational resource that used visualization and narratives to engage users that were unfamiliar with the topic and the technologies being used, and be persuasive about the impact of surveillance on their lives, regardless of their background and personal opinion about the benefits or evils of surveillance. Technologies like Automated License-plate readers (ALPR), cell-site simulators, acoustic detection devices, etc., can be used in combination to reveal a very detailed picture of a person's movements, activities, relationships, and other identifying details.

We wanted our our project to present a comprehensive overview of the technologies and the ways in which they are used, and they ways in which the information that is collected by these methods is shared between law enforcement agencies and the federal government. Increased data storage and integration capabilities make it relatively easy for this information to be collected widely and saved permanently, creating a detailed record of the movements and activities of thousands of people not investigation, that could be connected to their real identities with little effort.

We wanted to show that though that there are real needs for these technologies in law enforcement, but the potential for abuse or damaging leaks highlight the need for regulation and transparency.

Discussion of related work

You must discuss at least 3 pieces of related work for each student on the project. You must say how your project relates to these readings or projects, and provide an image or sufficient description of the related work for the reader to understand how it is related.

Koalas to the Max (http://www.koalastothemax.com/): Koala's to the max is a D3 project by Vadim Ogievetsky which converts an image into hierarchical layers of smaller and smaller circles. Each circle divides into smaller circles when moused over, gradually increasing the resolution of the image as the circles get progressively smaller. We had discussed the concept of graphically representing an individual in a mosaic of smaller images, to use the metaphor of the mosaic theory of privacy, and this code provided the starting point for doing that.
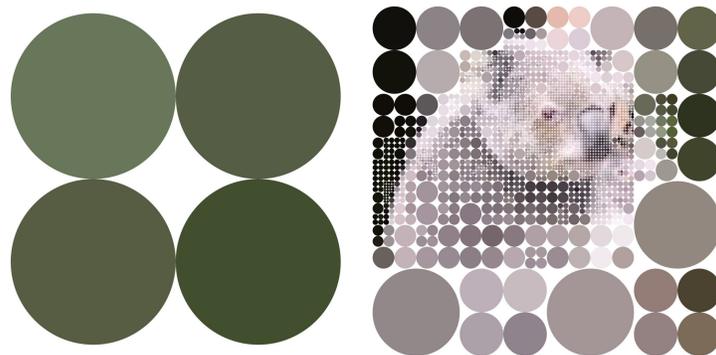
Maximum Koala

Street-level Surveillance (https://www.eff.org/sls**)**
This is a resource created by the Electronic Frontier Foundation (EFF) to provide an overview of domestic surveillance technologies using articles and narrative infographics. This site was an early inspiration for our fellowship project because of its use of design and its organization around different surveillance technologies and their capabilities.
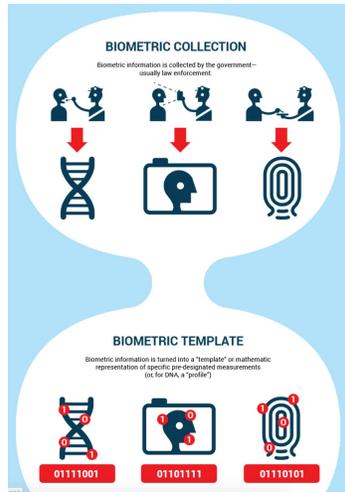
They Are Watching (https://theyarewatching.org/**)**
This site was created by the Washington State ACLU information related to surveillance. The site makes use of isotypes to communicate the potential impacts to civil liberties and recommendations for improving policies in an engaging visual manner.

Lucy Parsons Police Surveillance in Chicago
(https://redshiftzero.github.io/policesurveillance/)
Similar to the national scope resources, Lucy Parsons Labs' site relies on expository text, but is focused on Chicago and includes the type of data that we will list for the Bay area of California. This site was a good example of a report style resource about surveillance on a local level that includes links to documents obtained through FOIA public records requests.

Where

Unknown since the ALPRs are mobile. Documents acquired by the author in 2015 show that there were at least 35 vehicles in the Chicago Police Department that had ALPRs mounted to them. Chicago can also use their video surveillance network to scan license plates.

Costs

CPD has spent more than $690,000 on ALPR technologies in recent years.

Capabilities

Chicago Police Department purchases Motorola / PAGIS automated license plate readers. These devices track the GPS location a license plate was seen and the timestamp. The scanned plates are then checked against a Hot List that consist of plates of interest. According to FOIA documents acquired by the author, there might be as many as 300,000 license plates stored in the Hot List at any one time in Chicago - meaning that approximately 1 in 10 Chicagoans has their vehicle on the Hot List.

Unit 125
Information Specialist
P.O. Anthony
P.O. David Hol

Chicago Police Department
Automated License Plate Readers

From documents acquired by Jennifer Helsby

**Police Body Worn Cameras scorecard (**https://www.bwcscorecard.org/**)**
This site, a collaboration between The Leadership Conference and the web design firm Upturn, scores policies for body worn cameras across a number of U.S. cities. The site uses a matrix to represent how policies do and don't address different criteria for transparency and accountability. It does a good job of creating an overview of a large number of documents and allows for easy comparison between them.

EFF report on ALPR in Oakland
(https://www.eff.org/deeplinks/2015/01/what-we-learned-oakland-raw-alpr-data)
The Electronic Frontier Foundation produced a report with several visualizations of Automated License Plate Reader (ALPR) data acquired from the Oakland Police Department through a public records request. Though the data represents only a week worth of readings in 2014, there are over 63,000 data points. The report visualizes this data using heat maps as well as overlaying the reading locations on top of census data showing the disproportionate use of the technology in lower income neighborhoods and African American and Latino communities.
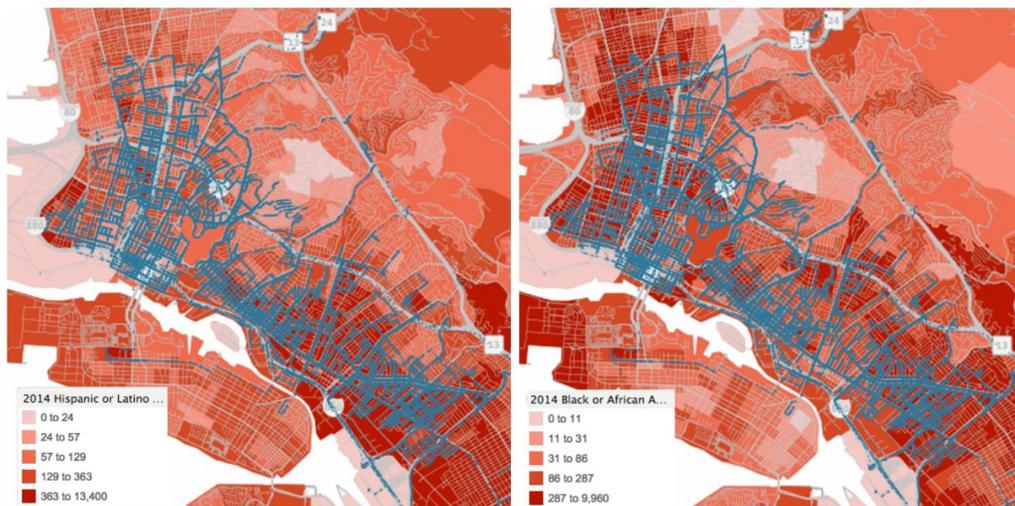
Mosaic Theory of Privacy:
(http://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=2379&context=fac_pubs)
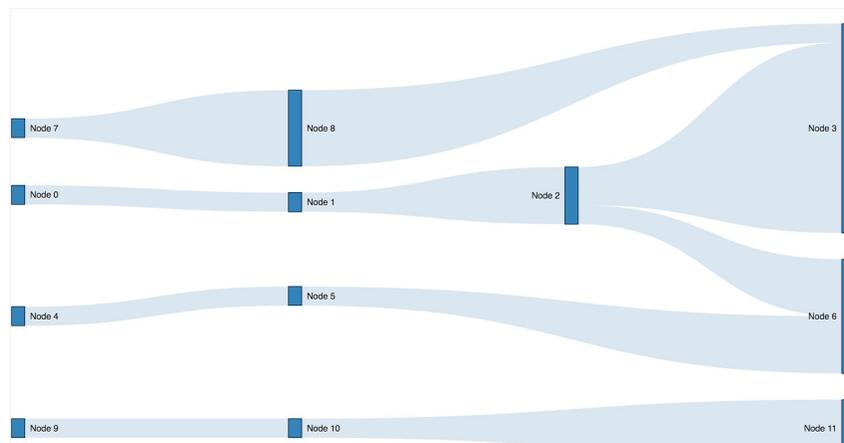Our concept for face mosaic was very inspired by a legal theory of privacy that asserts that information that is captured lawfully in public, like a GPS reading or ALPR data, can constitute an unlawful search when captured and aggregated over time because it creates a 'mosaic' of their patterns of movement and behavior. The Supreme Court decided in U.S. v. Maynard that so called 'dragnet surveillance' over an extended period could be considered an unlawful search. This was inspirational to our design of the face mosaic showing how an individual's information can be captured indiscriminately and reveal information about them.

Alluvial Sankey Diagram
(http://bl.ocks.org/ChrisManess/ebaacb5fd976657edad2)
We adapted this D3 Sankey diagram for our flow of information diagram. This revision of Mike Bostock's library version of the Sankey gave us the starting point to add icons to represent areas of personal information, technologies, agencies, and how information flows between them. This diagram was a useful starting point to work from to add the coloring and highlighting that we used in our final diagram.

Alluvial-Growth

Animated Gradient - Minard's chart of Napoleon's Russia campaign
(https://bl.ocks.org/nbremer/a6690ca67800a2abafcd71ef4725f33f)
This D3 version of Minard's famous diagram of Napoleon's Russia campaign was inspiring for its use of gradient animations indicating directional flow of the troops. We implemented this in a very subtle animation in our Sankey diagram to show the flow of personal information into technologies and onto agencies that collect as an aide to the viewer to understand the direction of the diagram and the process of information collection.

Data

Our goal was to get people to think more critically about how their personal information can be collected by several technologies used by local police, and how much detail may be being revealed about them through their actions. Given this goal, and the lack of data available about how these technologies are being used, we took a more interpretive approach to modeling the impact of surveillance tools. We used the several months of research for our CTSP fellowship to come up with a scoring rubric for the level of intrusion that each technology has on individual privacy. In some cases, these scores covered a range depending on whether they were used to the full extent of their capabilities. We then came up with a set of survey questions about individual behavior that were likely to determine the likelihood that an individual would be captured or observed. Though the result is not qualitative, but hopefully inspires the user to think about the implications that surveillance technologies have for personal privacy, and where they may come in contact, knowingly or unknowingly, in the course of their daily activities.

The data visualized in the Sankey diagram and the map visualization of the equipment known to be used by different agencies and the data sharing relationships between agencies were taken from news articles and public documents that have been acquired through various public records requests.

Tools

We used D3 to construct the face-mosaic and the Sankey diagram. We adapted a bootstrap template to create the framework for the page. Leaflet.js and Mapbox tile-layers were used to create the map of the data sharing relationships between agencies. Adobe Illustrator was used to create the icons and isotypes used to represent the technologies.

Steps required to accomplish goals

The substance of this project is based on several months of research and interviews conducted for our CTSP fellowship project related to privacy in the city of Oakland. We've spoken to a number of stakeholders, city officials, activists, and subject matter experts about the topic and what tools for engagement they think are most useful. This project was an opportunity to produce a deliverable for this project based on this research.

We took these ideas and spent several sessions at the beginning of the project defining our goals for the project proposal and sketching ideas. After several rounds of ideation, we grouped the sketches into similar ideas and selected & combined features of those that we thought were the best. Then, we walked through the sketches with other students to get feedback on our initial designs and see if the designs met our stated goals. This feedback was incorporated into our planned design.

From those initial designs, we sought to figure out the technical implementation of the designs and to understand how technical limitations (either of the system or of our capabilities) would cause modifications of the design. We found examples of D3 implementations that we could build from to match our designs (see KoalasToTheMax and Alluvial Growth Sankey) and gained new skills such as how to use libraries like MapBox (via InfoViz guest lecturer Chris Henrick). We also decided to host our design on GitHub using a Bootstrap template to allow animated and responsive layouts.

We then worked through the implementation process, ensuring components could be integrated into one site and also refactoring design choices as needed to accommodate the realities of implementation. Through this process, we formalized the scoring data of the technologies and relationships into JSON formatted data files to allow future modification of the data. Intentionally, we stayed away from hard-coding any values as the scoring process can be considered subjective and we wanted the data to be adjusted if needed in the future. Even, technology descriptions, agency locations, colors and node sizes for the sankey are described in JSON and dynamically loaded.

After implementation, user testing was conducted as detailed in the following section. From user results, we changed some elements of the design (also described below). Some changes were not implemented due to the lack of time for additional user testing or actual development.

User Research

Introduction

One of our goals is to have this project serve as an education tool for the average Bay Area citizen to inform themselves about surveillance in their community and how it can personally affect them. In order to achieve this goal, we set out to interview 15 potential users with a wide range of surveillance experience in order to assess the efficacy of our design.

Participants

We conducted formal usability interviews with 7 individuals, and ad-hoc interviews with approximately 10 individuals. The median age of our participants was between 20-30 years old, with just over half of our participants being female. Importantly, all participants were Bay Area residents, and when we asked people to self-describe their familiarity with surveillance, we had three "little to no experience" responses, 6 "some experience" responses, and two "moderate experience" responses

Methodology

All interviews were conducted between Tuesday, 5/2/2017, and Wednesday, 5/3/2017. We used a mixed method of formal usability interviews and ad-hoc interviews at the InfoViz Final Project showcase in order to assess our design Look/Tone/Feel and efficacy in educating the general Bay Area public.

Usability Interviews

Usability Interviews were conducted 1:1 with a member of Team Stinkray and a participant. Seven 30-minute Usability Interviews were conducted in full, with a wide range of people from the general public. Full Usability interview question script can be found in our appendix.

Ad-hoc Interviews

Ad-hoc interviews were conducted by Team Stinkray members and participants of the InfoViz Final Project Showcase, along with one active professional in Bay Area Surveillance. These interviews did not cover the full breadth of the usability interview, but incorporated some of the questions and allowed users to explore and interact with the site.

Google Forms Survey

The Google Forms Survey was used to collect data about participants who viewed the website. All questions were voluntary; the first section assessed what the participants

had learned, and the second section collected demographic information. All usability interview participants took the survey, while only a select few ad-hoc participants took the survey. The entire google forms results (in the order they were presented to the users) can be found in the appendix.

User Research - Results

We have broken the results into sections to match the usability study and subsequent survey: (1) Overall Look/Tone/Feel, (2) Quiz, (3) Technologies, (4) Agencies, (5) Sharing Data, (6) Implications, (7) Get Involved, (8) Google Forms Survey.

(1) Overall Impressions and Look/Tone/Feel
None of the users were distracted by the Look/Tone/Feel of the site, in fact many of them commented that they liked how "approachable" it felt for such a heavy topic. When prompted for initial impressions, 3 out of the 7 usability interviews commented that they thought the initial image looked "grainy," which we are looking to change in the upcoming iterations. We had mixed reviews over the amount of text on the page - some users really liked how detailed and thorough the project was, while others wanted solely visuals.

Summary: good and approachable, change the main image, consider shorter quotes.

(2) Quiz
"This is so cool!! ...and kinda creepy" (user after completing the quiz)
All of the participants in the usability interviews and ad-hoc interviews liked the quiz, but many of them could not explain what they were doing until they had already completed the survey. For instance, many users thought the larger the circle, the more data was captured about you (when, in fact, the opposite was stated under the main image); however this was cleared up after they completed the quiz. This tool was an excellent way for users to try different personas and discover the impact of different variables on different areas of surveillance, and it encouraged critical thinking and dialogue that was valuable and encouraging, and we found the personas developed helped shed light on the variables that were most pertinent.

Summary: One of the favorite visuals of the project, users spent the most time on this visual exploring the different variables; consider moving persona buttons to the top to encourage exploration, keep profile of "YOU" for generic person

(3) Technologies (orange section)
"I had no idea there were technologies that actually do this; I like that the icons match my mental model of what actually happens" (user on "Stingrays")
Many users in both sets of interviews found this section to be valuable as they learned about technologies they had never heard before, and they repeatedly referred to this

section as they continued through the project. We would recommend making the font bigger and a little more salient to users, and removing any excess text.

Summary: People liked the iconography, consider decreasing the description and increasing the font size.

(4) Agencies (sankey)
"If I am completely connected, they know me in my elements - completely" (user on information flow from behaviors to agencies)
While almost every user commented how they liked how visually interesting this visualization was, many found it difficult to read or explain what was going on, and 5 of the 7 usability interviews explained it in terms of "[agency] uses [technology] to track [behavior]" - which made us realize it is easier for participants to understand the flow of information in terms of WHO is collecting the information (i.e., OPD uses Shotspotter to track What you Say), rather than WHAT is being collected (What you Say is being collected by Shotspotter, and OPD access that data).

Summary: Allow highlight of one technology for scan-ability, reverse order on Sankey to read From Agency > Technology > Behavior, put main content box on the left to visually attract people to read it.

(5) Sharing Data (map)
"Wow - something is being shared - there's data flowing - but what is ALPR?"
It was clear from user interviews that by the time they reached this visualization they had already forgotten the acronyms of the technologies. This visual helped "cement the fact that all of these agencies share this stuff" but we need to remind the users what the "stuff" is. Additionally, the grey format did not match the LTF of the site, recommend changing it to another theme.

Summary: It is effective in showing data is flowing from agencies, but we need to share what type of data it is. Add iconography to symbolize what is being shared, put descriptions and what is being shared closer to buttons. Change map theme to match LTF of site.

(6) Implications (filtering + light boxes)
"Woah I've definitely seen those in the wild -- that's what they are?!"
Many users liked the filtering feature to see how their quiz questions related to the technologies they just learned about (i.e., "cell phone" is related to SMM and Stingray), but it was too far away from what they had just learned, and Prof Hearst recommended moving it closer to when we first introduce the technologies. We also received comments that the text was too small in the light boxes, but users did like to see the images of the technologies "in the wild."

Summary: To stay consistent with user's mental models, move closer to the orange technologies section.

(7) Get Involved and Final Impressions
"It makes me more conscious of what's being surveilled, and makes me want to do something"
While users generally liked a "call to action," it was unclear if they would actually be compelled to do anything more than they currently were doing. It served the purpose of getting the general public aware of police surveillance, but we do not believe it increased the participation.

Summary: Consider a more direct "Call to Action" integrated with Steve's Oakland City Commission Twitter bot (i.e., "tomorrow is a meeting on surveillance technology at 5pm in room b")

(8) Google Forms Survey Feedback (See appendix for results)
From the Google forms feedback we received (n=13), we can see that most individuals learned about shotspotter, while 50% are still unclear about ALPR, which may be clarified with iconography on the map. When assessed on what the surveillance agencies know and how they know it, all participants could list most of the tools and behaviors used, which is overall a successful visualization. All participants would recommend this tool to a friend or colleague.

User Research - Conclusion and next steps

Based on our user research, we would say this project was overall successful in creating an educational tool that can serve the general Bay Area citizen in raising awareness and education of the types of surveillance tools that exist and are being used in their own backyard. We have incorporated the most salient user feedback, and we would like to look into using storyboards or animations to show how these technologies can be used in parallel to capture more data about our already defined personas.

Links to demos

The final product is hosted here: https://strushucb.github.io/opp/
Final code package is located: https://github.com/strushucb/opp/tree/master/docs
Javascript files included with the bootstrap theme are located in the base folder:
https://github.com/strushucb/opp/tree/master/docs/js

Our JS code (non-HTML/CSS) is in the subfolders:
Face design: https://github.com/strushucb/opp/tree/master/docs/js/face/
Map design: https://github.com/strushucb/opp/tree/master/docs/js/leaflet/
Sankey design: https://github.com/strushucb/opp/tree/master/docs/js/sankey/

Distribution of work table.

Work Item	Person(s)
Research & Content Generation	Steve (25%), Peter (25%) (Emily and Shazeda - 50%)
Concepts and Design	Steve (33%), Peter (33%), Michelle (33%)
Relevant Work Inspirations	Peter (50%), Steve (50%)
Face Mosaic	Steve
Sankey Diagram	Steve
Iconography	Michelle
Site Layout and design	Michelle
Interactive Map	Peter
Implications of use filtering	Michelle
Content Integration	Steve (50%), Michelle (50%)
User Research	Michelle (50%), Steve (25%), Peter (25%)

Appendix: Screenshots

Base view of face mosaic

Face Mosaic: Persona view

Meet the technologies used in the Bay...

Automated License Plate Recognition (ALPR)

ALPR systems capture the image of every license plate in view and store the date, time, location (in GPS coordinates), and license plate number as text in a database for a specified amount of time. They are placed on highway ramps, overpasses, streetlights, and utility poles, as well as mounted on police vehicles.

Public Camera Systems (CCTV)

Public Camera Systems record in public areas, often without notice. Camera systems used to record public spaces are stationary, mounted on vehicles, and worn by police. Government agencies may have agreements with private entities to access their recorded data as well. As technology increases in capability, more recorded video and audio can now be stored for longer periods of time.

Shotspotter

Shotspotter is a proprietary surveillance tool that captures audio from the surrounding environment in order to detect and locate gunshots. The system can be triggered by other loud noises and capture other sounds including human voice.

Social Media Monitoring

Social media analysis tools aggregate data from user profiles on platforms such as Facebook and Twitter, monitoring posts, photos, events, and other activity along with information about users' locations. Police forces have used these systems to respond in real time to protests as they unfold, as well as to conduct longer-term tracking of individuals.

Cell Site Simulator (Stingrays)

Stingrays send out signals that mobile phones interpret as coming from a cellular network tower. In turn, the simulators receive signals from mobile phones in their vicinity which can be used to identify specific devices and their owners.

Icons and technology descriptions

... and the implications of their use.

All   Cell Phone   Car   Public Transit   Income   Public Spaces   Social Media

Technology interactions

Pop-up modal with technology description

Stingrays

Stingrays (Cell Site Simulators)

Representatives from the Committee on Oversight and Government Reform have expressed concern about the Department of Justice and its component agencies using CSS under nondisclosure agreements that can impede government oversight into their use. This is additionally troubling because despite their employment in targeted searches for particular individuals, CSS indiscriminately gather metadata from nearby mobile phones, including those of citizens whose movements law enforcement are not authorized to track. Acquisition of a cell phone's unique identifiers can be used to initiate wiretaps and obtain call records.

In cities such as Baltimore, local police departments have been known to retain a degree of secrecy around their use of CSS. As a result, it is difficult to assess their efficacy. Lawyers who are unfamiliar with these devices should be aware of the other names used to describe them, including brands such as StingRay and Hailstorm, or the alternative term IMSI catcher (referencing the International Mobile Subscriber Identity number the devices capture.) Watchdog organizations should take note of instances in which CSS have collected data beyond the parameters of signal strength and general direction in which a target phone is located, as the Department of Homeland Security as listed these as the main forms of metadata the devices are allowed to gather. Likewise, since the DHS has made efforts to enforce CSS data minimization and deletion, civil liberties protection groups must be vigilant about information gathered on non-target subjects that has been investigated illegally or not erased for other purposes.
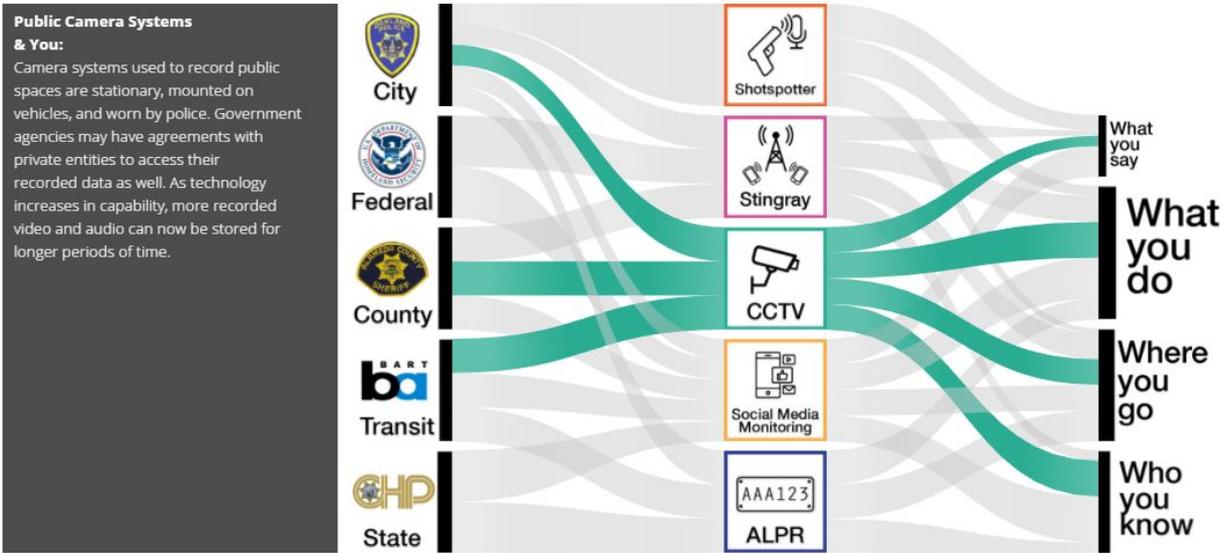

Acoustic Detection Systems (ShotSpotter) & Oakland Police Department:
"Oakland police are considering scrapping the city's gunshot detection system that some residents in high-crime neighborhoods say makes them feel more secure. ShotSpotter is an 8-year-old network of microphones that detect gunfire in most parts of East and West Oakland, record the audio, map the location and send an alert to patrol officers within 20 seconds. But the system, which costs the department $264,000 a year, is expensive and redundant, police contend. They say residents already call to alert police when they hear gunfire, and the money could be better used to fund other technology, such as the police helicopter." (SFGate, 2014)

Technology - Agency relationship chart

Public Camera Systems & You:

Camera systems used to record public spaces are stationary, mounted on vehicles, and worn by police. Government agencies may have agreements with private entities to access their recorded data as well. As technology increases in capability, more recorded video and audio can now be stored for longer periods of time.
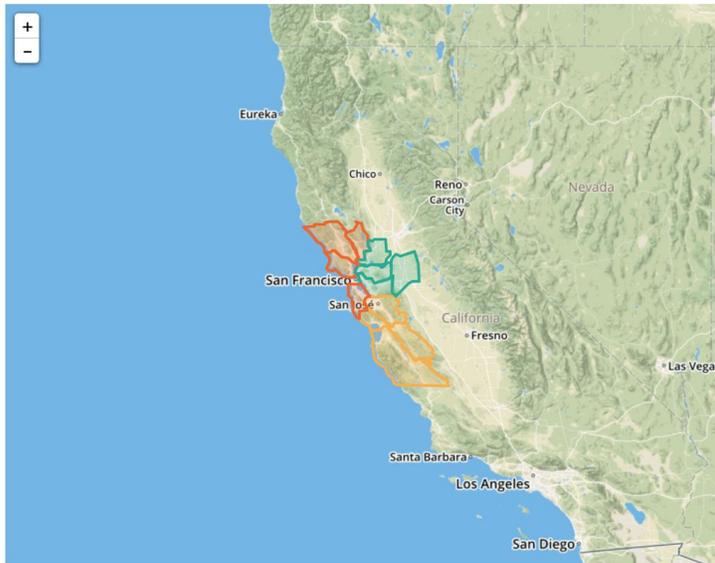
City

Federal

County

Transit

State

Shotspotter

Stingray

CCTV

Social Media Monitoring

ALPR

What you say

What you do

Where you go

Who you know

Technology - Agency relationship chart with mouse highlighting

Explore these relationships:

ShotSpotter Data Shared with SST Technologies

ALPR Data Shared with NCRIC

Bay Area Urban Area Security Initiative (UASI)

Several Bay Area cities contract with SST Technologies for gunshot detection using the ShotSpotter system. SST manages and owns all the data collected by their network of audio sensors. (source)

Audio Recordings
Location
Time

Law Enforcement Agency

SST Technologies

Map interaction: Shotspotter data flows in Bay Area

Map Interaction: Data sharing agreements between counties

Explore these relationships:

ShotSpotter Data Shared with SST Technologies

ALPR Data Shared with NCRIC

Bay Area Urban Area Security Initiative (UASI)

Bay Area counties participate in three regional intelligence sharing programs ARIES, West Bay COPLINK, and South Bay COPLINK. The scope of the data shared between these programs and with Federal agencies is **currently unknown.** (source)

ARIES
West Bay COPLINK
South Bay COPLINK

Sources for Bay Area Surveillance Project

Quiz Section Sources

- Concept inspired by KoalasToTheMax: http://koalastothemax.com/
- "When Enough is Enough: Location Tracking, Mosaic Theory, and Machine Learning": http://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=2379&context=fac_pubs

Quotes:

- BBC: http://www.bbc.com/news/magazine-37411250
- Ars Technica: https://arstechnica.com/tech-policy/2017/01/how-an-ex-cop-tries-to-get-a-police-department-to-think-about-privacy/
- ACLU Northern California: https://www.aclunc.org/blog/how-fight-stop-oaklands-domain-awareness-center-laid-groundwork-oakland-privacy-commission

Agency Section Sources:

Oakland Police Department
- KGO News: http://abc7news.com/news/officials-look-to-block-opd-access-to-cellphone-data/1719467/
- Ars Technica: https://arstechnica.com/tech-policy/2015/03/we-know-where-youve-been-ars-acquires-4-6m-license-plate-scans-from-the-cops/2/
- KGO News: http://abc7news.com/news/officials-look-to-block-opd-access-to-cellphone-data/1719467/
- East Bay Express: http://www.eastbayexpress.com/oakland/oakland-cops-quietly-acquired-social-media-surveillance-tool/Content?oid=4747526
- Oakland Police Department: http://www2.oaklandnet.com/oakca1/groups/cityadministrator/documents/form/oak031867.pdf
- SF Gate: http://www.sfgate.com/crime/article/Oakland-cops-aim-to-scrap-gunfire-detecting-5316060.php/

BART
- East Bay Express: http://www.eastbayexpress.com/SevenDays/archives/2016/04/27/bart-police-quietly-installed-license-plate-surveillance-cameras-at-oakland-station
- CNN Money: http://money.cnn.com/2017/02/07/technology/cop-surveillance-aclu-santa-clara-bart/
- SF Gate: http://www.sfgate.com/crime/article/BART-killing-exposes-security-gap-many-train-6757514.php

Alameda County Sheriff's
- East Bay Express: http://www.eastbayexpress.com/oakland/alameda-county-da-seeks-controversial-surveillance-device/Content?oid=4381519

Sharing Section Sources:

- Mercury News: http://www.mercurynews.com/2013/11/11/shotspotter-has-long-history-with-bay-area-police/
- CEHRP: https://www.cehrp.org/license-plate-reader-data-sharing-at-northern-california-regional-intelligence-center/
- Bay Area UASI: http://www.bayareauasi.org/sites/default/files/resources/010815%20Agenda%20Item%208%20Appendix%20A%20Public%20Safety%20Information%20S

Sources page

Usability Interview Script (30 mins)

Thank you so much for taking the time to chat with me today. We're working on a student project for info viz, and we have a few questions to ask you about our project - it should take about 30 minutes. Just a little bit of background about this project: this is a student project on government surveillance in the bay area, and I will be showing you a website and asking you a few questions, but I would also like you to think aloud and share with me what are some things that come to mind when you look at our prototype. I just want to be clear - we are not evaluating you, we are evaluating the design - and your feedback is incredibly valuable. I'll also be taking notes, but I will not identify you. You are free to leave at any time. Do I have your permission to continue?

1. Before we get started, can you tell me a little about yourself: how familiar are you with the state of surveillance?
2. [Pull up website] Feel free to explore the site. What is your initial impression?
3. [ask ANY follow up questions]
   a. [Quiz] Can you explain to me what is going on here? What are these images (personas)?
   b. [Meet the Tech] What are your initial impressions? (what would they like to see about these technologies/surveillance tools? Is this what you expected? Are there points you would like to have more information about?)
   c. [Sankey] What do you think? (probe about side panels)
   d. [Map] What is going on here?
   e. [Implications] Do these implications match what you think would happen?
4. Before we go, are there any other thoughts you'd like to share about this prototype?
5. I think that's all of the questions I have for you! Thank you so much for taking the time to chat with me. Would you mind taking 2 minutes to fill out a quick survey? After the survey, I am more than happy to answer any questions.
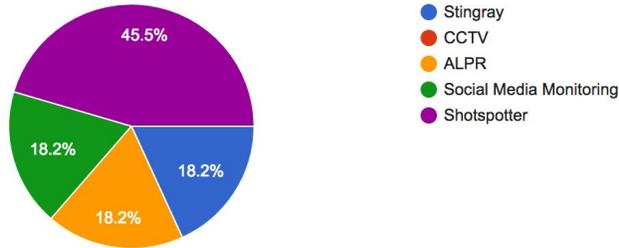
Sources:
https://strushucb.github.io/opp/
http://bit.ly/infoviz2017

Usability Survey Results (asked in this order, after seeing website)

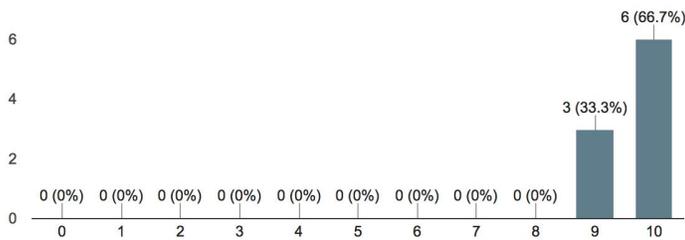### Which technology did you find you learned the most about?

11 responses

- Stingray
- CCTV
- ALPR
- Social Media Monitoring
- Shotspotter

45.5%
18.2%
18.2%
18.2%

Which technology are you most unclear about?

12 responses

- Stingray
- CCTV
- ALPR
- Social Media Monitoring
- Shotspotter

50%
33.3%
8.3%
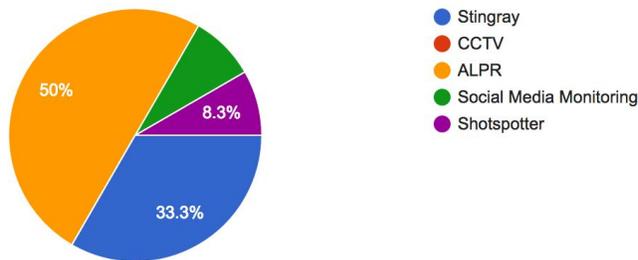
On a scale of 0 to 10, how likely are you to recommend this to a friend or a colleague?

9 responses

How do agencies know information about you?

10 responses

A lot of surveillance technologies?

Their tracking devices

They are sent the data

sharing data, using monitoring technologies (I feel like I need an essay to write this?)

Through the technology listed above - lots of channels to track and surveil

because they steal it! and because i share it

multiple ways of gathering info from public locations

Cell phone monitoring

Social Media, CCTVs, Phone Tracking

Through social media, the transportation you use, the places you go

What type of information is known about the public's behavior?

10 responses

Who I know, Where I go, and more.

Where they are, who they hang with, what they do, one other

Where we go and what we do

who you know, what you do, where you go and what you say

Your day to day whereabouts, what you say, what you do
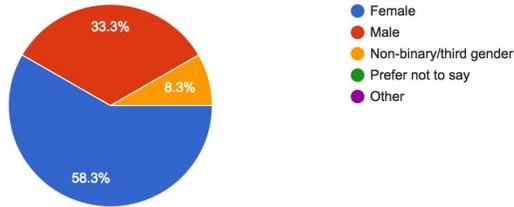
a lot

movement, loud noises, cell metadata

的

Personal information, daily activities

Where you go and when, what you do and what you say
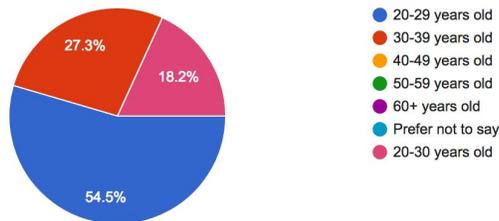
Demographic Google Forms Survey Results
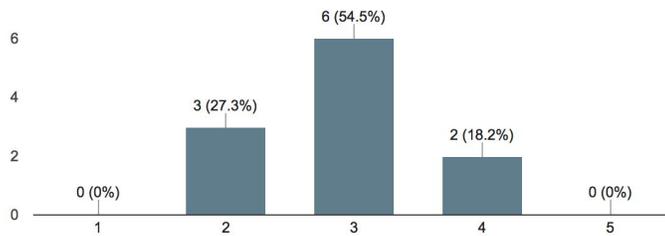
What is your gender?
12 responses

- Female — 58.3%
- Male — 33.3%
- Non-binary/third gender — 8.3%
- Prefer not to say
- Other

What is your age?
11 responses

- 20-29 years old — 54.5%
- 30-39 years old — 27.3%
- 40-49 years old
- 50-59 years old
- 60+ years old
- Prefer not to say
- 20-30 years old — 18.2%

How familiar are you with surveillance?
11 responses

- 1: 0 (0%)
- 2: 3 (27.3%)
- 3: 6 (54.5%)
- 4: 2 (18.2%)
- 5: 0 (0%)

Are you a resident of the Bay Area?
12 responses

- Yes - Berkeley — 66.7%
- Yes - Oakland — 25%
- Yes - SF — 8.3%
- No - Prefer not to say
- Other