Aaron Straup Cope

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Professional Objective

I have worked at **Flickr** [1] helping to build and nuture the beautiful monster that it became, made pretty maps at **Stamen Design** [2] , re-opened the **Smithsonian Design Museum** [3] re-imagining what it means for a museum to hold hands with the Internet and built a high-quality, openly-licensed **gazetteer of all the places** [4] in the world at **Mapzen** [5] . In my current role at the **San Francisco International Airport Museum** [6] I am working to develop a robust and sustainable technological practice to meet the needs and the constraints of both the cultural heritage and public sectors.

The promise of the Internet is to be a bridge for cross-pollinating peoples, ideas and communities. I am looking for opportunities to design and build the tools that will continue to realize the idea of the network as a public good.

Core Competencies

Programming:

Go, Python, PHP, Swift, JavaScript, Perl, Java.

Languages:

English, French.

Employment History

Head of Internet Typing
San Francisco International Airport (SFO) Museum [7]
2018-Present

Lead developer and architect for a project to consider what it means for a museum in an airport, an airport with over 58 million visitors in 2019, to operate in a world where (almost) everyone is connected to the internet and to learn what are the opportunities and responsibilities, as a cultural heritage organization, to everyone who passes through SFO equipped with curiosity and a computer connected to the internet.

Although the museum has a long history of self-sufficiency in traditional museum-related operations it has lacked equivalent digital skills relying instead on third-parties and outside vendors to maintain its online presence. My role has been to develop the infracsture and practices necessary for the museum to take ownership of its digital needs and desires (past, present and future) while still operating within the constraints of a cultural heritage organization and local government.

These efforts have been documented in detail on the **Mills Field weblog** [8] . These include:

○ *Designing, building and maintaining the* ***SFO Museum Wayfinding System*** *[9] , a serverless interactive system to allow passengers to determine a route between any two points at SFO and to see related Museum programming close to those routes. Routes can also be derived by flight number or by scanning a boarding pass using an on-device, privacy-preserving barcode reader. Individual routes, and associated contemporary and historic Museum programming, can be delivered to passengers as customized PDF or EPUB publications. The Wayfinding system was developed to be both a practical resource to help passngers travel through the SFO terminal complex but also as a means to help foster an understanding of the breadth*

and history of SFO Museum's activities at the airport over time.

○ _Designing, building and maintaining the_ **SFO Museum Aviation Collection website** _[10] , the online catalog of the SFO Museum Aviation Museum and Library Collection. This website is the public face of the museum's permanent aviation collection of 140, 000 objects and the nucleus of second and third order features and projects to be developed around the collection._

○ _Designing, building and maintaining the_ **Interactive Historic Maps of SFO** _[11] installation in the Terminal 2 SkyTerrace Observation Deck. An interactive map installation that allows visitors to view the history of SFO by browsing over three dozen aerial maps from 1930 to 2021. Originally designed as a touch-based interactive application to work entirely offline, it was updated in 2020 to allow visitors to control the map using their personal mobile devices. The installation displays a QR code that a visitor can scan which will launch a "controller" application that relays instructions from their mobile device to the application. This work was the subject of the essay "Fast & Cheap, Stable & Reusable: Reimagining Touch-based Interactive Installations at SFO Museum during the COVID-19 Pandemic", published in the Spring 2023 issue of AAM's_ **National Association for Museum Exhibitions** _[12] journal._

○ _Designing, building and maintaining the_ **Mills Field website** _[13] which acts as a public-facing proving-ground for all present and future projects including: Improving and broadening the reach of all collections-related materials, cataloging and documenting past museum activities, modeling the airport's physical geography over time, interface and interaction experiments and public and private application programming interfaces (API)._

○ _Building the infrastructure for the museum's_ **online mapping efforts** _[14] including sourcing historical maps from the airport GIS department to producing and hosting its own contemporary basemaps._

○ _An_ **open source, and serverless, image processing workflow** _[15] for creating mulitiple derivative image sizes in additional to tiled and zoomable images for a variety of sources including the museum collection and its social media effort._

○ _Developing the workflow to catalog_ **historical and contemporary flight data** _[16] (2007 - present) at SFO integrating that data with the museum's own collection._

○ _Designing and developing secure, sustainable and low-maintenance interactive applications around the museum's collection that can be deployed throughout the airport terminals._

○ _Working with both the Airport Commission and City of San Francisco IT departments to integrate secure credentialing for museum-related websites and services._

Editor at Large – Creator, Architect and Head of Engineering for Who's On First (WOF)
Mapzen [5]
2015-2017

Creator, Architect and Head of Engineering for Who's On First (WOF), an openly licensed gazetteer of all the places and all their metadata in the world, ranging from continents to neighbourhoods and venues. WOF was published as a public resource and a series of API-based services and used internally by a variety of Mapzen services including Search (geocoding) and Tiles.

The goal of WOF is to provide high-quality and openly licensed location data with global coverage specifically designed for use with a broad range of applications, datastores and programming languages, while ensuring long-term durability and portability of both the data and the services.

In January 2018, Mapzen announced that it would cease operations. WOF **continues to operate** [17] as a community-driven open-data and open-source project at **whosonfirst.org** [4] . All of the data and source code continues to be developed and distributed through the **whosonfirst-data** [18] and **whosonfirst** [19] GitHub organizations, respectively.

To date approximately **60, 000 words of theory and practice** [20] have been written about the project on the Who's On First weblog. A good introduction is the 2016 talk titled **Mapping With Bias** [21] and a detailed discussion of the project's goals and motivations is the 2015 blog post **Who's On First** [22] .

○ _Designed the_ **overall data model and architecture** _[22] for the project._

○ _Designed, built and maintained public-facing services related to WOF including the_ **Spelunker** _[23] and the_ **API** _[24] and the initial version of the WOF editorial tools (code named "Boundary Issues")_

- ○ *Designed, built and maintained all of the databases, deploy tools and software libraries for both public-facing and internal editorial workflows. Software was purposefully written in a variety of languages including **Go** [25] , **Python** [26] , **PHP** [27] and **JavaScript** [28] specifically to ensure that design decisions around the data modeling did not encode the biases of any one language or toolset.*

- ○ *Managed the engineering team, contractors and oversaw day-to-day technology decisions.*

Head of Engineering, Digital and Emerging Media
Cooper Hewitt Smithsonian Design Museum [29]
2012-2015

Head of engineering and technical architect for all public facing and internal digital initiatives related to the re-opening of the Smithsonian Cooper Hewitt Design Museum in 2015. This work was documented in The Atlantic magazine's 2015 **The Museum of the Future Is Here** [30] profile and culminated with **The Pen** [31] an NFC-enabled stylus, custom designed and manufactured by the museum, given to every museum visitor.

The Pen allows visitors to collect objects on display and retrieve them post-visit as well as produce new works on multi-user interactive tables located through the museum. It works in concert with purpose-built API designed and maintained by the museum and enables both internal and third-party in-gallery experiences. Launched in March of 2015, The Pen has been in continuous use since then. As of **January 2018** [32] it has been given out to $350,000$ visitors; used to collect objects 14 million times; and used to create over $300,000$ designs.

The technical, manufacturing and institutional challenges (and successes) that were prompted The Pen are discussed at length in **Strategies against architecture: interactive media and transformative technology at Cooper Hewitt** [33] , a formal paper presented at the 2015 Museums and the Web conference and **The Pendulum of Bespokiness** [34] , a presentation delivered at the 2016 Bosch Connected Experience conference.

- ○ *Designed, built and maintained the **Cooper Hewitt collections website** [35] and **API** [36] which acts as a unified interface for all public-facing, internal and third-party integrations with the museum collection, including the Pen and features like **search by colour** [37] . The Collections website won the Best Research/Collections Website award at the 2013 Museums and the Web conference as well as the award for best Applications and API website at the 2013 American Alliance of Museums conference.*

- ○ *Co-curator for the Smithsonian's first acquisition of code: **Planetary** [38] , an interactice music player for the iPad. **(Complete press coverage of the acquisition is listed here.)** [39]*

- ○ *Acted as technical liason with the Smithsonian's Office of the Chief Information Officer (OCIO) on all matters relating to the Cooper Hewitt's digital and exhibition infrastructure.*

- ○ *Managed the engineering team and oversaw day-to-day technology decisions.*

Internet Typist (and general layabout)

2012-2012

Combination self-employed and self-imposed sabbatical spent implementing and investigating the practice of archiving and of running shadow copies of popular social networking websites.

- ○ ***Parallel Flickr** [40] — a tool for backing up your Flickr photos and generating a database backed website that honours the viewing permissions you've chosen on Flickr. It was presented at the Internet Archive's 2012 **Personal Digital Archiving conference** [41] .*

- ○ ***Privatesquare** [42] — a "looking-glass archive" web application to record and manage a private database of foursquare check-ins with the option of recording them in a public service after the fact.*

- ○ ***Parallel-ogram** [43] — a simple web application to create a local backup of Instagram photos and "likes" and to make that archive a living, breathing website of its own.*

Design Technologist
Stamen Design [2]
2009-2011

Senior developer responsible for taming source data and designing and implementing technical systems for a wide variety of clients and research projects. Also, maps.

○ **Surging Seas** *[44] (2012) — a project with **Climate Central** [45] to visualize the effects of sea-level rise and storm surges in the United States.*

○ **map=yes** *[46] (2011) — a project with **MapQuest** [47] to demonstrate what their mapping APIs, and commitment to the OpenStreetMap project, affords to developers and designers alike.*

○ **prettymaps** *[48] (2010) — an experimental interactive map composed of multiple freely available, community-generated data sources designed to explore and celebrate the edges of what is possible in web-based mapping.*

○ **Cheerio Maps** *[49] (2010) — an experimental map to visualize housing data in the San Francisco Bay Area.*

Lead Engineer
Flickr [50]
2004-2009

Lead engineer for the **Flickr** [50] photo sharing/management web application; designed, implemented and maintained the geotagging and machinetag infrastructure; primary contact for security issues; primary contact for integration projects with its parent company Yahoo!.

○ **Galleries** *[51] (2009) — a way for users to curate up to 18 public photos or videos from other Flickr users into one place around a theme, an idea or "just because"; galleries were a way to encourage Flickr users to try and see their time and involvements on the site as something other than self-promotion or collecting view counts.*

○ **Flickr Shapefiles** *[52] (2008) — we asked the question: "If we plotted all the geotagged photos associated with a particular location, would we have enough data to generate a mostly accurate contour of that place? Not a perfect representation, perhaps, but something more fine-grained than a bounding box." It turns out we did!*

○ **Machine tags** *[53] (2007) — a lightweight and easy means for users to add extra semantics to their tags and to use those tags as a kind of key in to third-party services; there are currently over 2M tags with **foursquare** [54] venue IDs as well as many other smaller bespoke projects.*

○ **Geotagging** *[55] (2006) — the ability for users to geotag their photos; there were 1M geotagged photos added in the first 24 hours and today there are over 300M geotagged photos.*

○ *Just keeping the site up (2005) — it was a very busy year.*

Personal projects and activities

Public speaking
2007-Present

I have been **speaking publicly since 2007** [56] on a variety of personal and work-related subjects including Flickr, maps and cultural heritage. I have been a frequent speaker at the **Museums and the Web** [57] , **Museum Computer Network** [58] , **Openstreetmap State of the Map** [59] and **North American Cartographic Information Socirty (NACIS)** [60] conferences.

A complete list of talks is available at **https://www.aaronland.info/talks** [61]

go-iiif

go-iiif [62] is a fork of the **iiif** [63] package that moves all of the processing logic for the **IIIF Image API** [64] in to discrete Go packages and defines source, derivative and graphics details in a JSON config file. There is an additional caching layer for both source images and derivatives.

Brooklyn Integers

Artisanal Integers as a service [65] . A very elaborate joke, but a useful one. The canonical text on artisanal integers is the **time pixels** [66] keynote from the 2012 **New Zealand National Digital Forum** [67] but a more approachable introduction is neverendingbook.org's **artisanal integers** [68] .

The Mirror Project
2001-Present

The Mirror Project [69] was one of the earliest community-driven photo-sharing websites to promote built to encourage and showcase "adventures in reflective surfaces". In a world before selfies...

Education

Studies in Studio arts, 1993-1997
Nova Scotia College of Art and Design [70]

Publications

Aaron Straup Cope. "**Fast & Cheap, Stable & Reusable: Reimagining Touch-based Interactive Installations at SFO Museum during the COVID-19 Pandemic** [12] ". exhibition (AAM National Association of Museum Exhibitions). 2023.

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Miscellany

Code samples and current projects are available for review on the **@aaronland** [83] and **@whosonfirst** [19] and **@sfomuseum** [84] GitHub organizations. Older code is available for review on the **@straup** [85] and **@thisisaaronland** [86] GitHub accounts.

I have been maintaining a personal weblog since 1999. [87]

This document is available in the following formats : **Plain-text** [88] , **HTML** [89] , **PDF** [90] and **XML** [91] . The code used to generate these documents is available as **open source software** [92] .

References

Available upon request.

External links

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