2017 ANNUAL REPORT

Smithsonian
DIGITIZATION PROGRAM OFFICE

FROM THE DIRECTOR

I stepped into the role as Director of the Digitization Program Office (DPO) in February of 2017, so for me the year consisted of 11 months. But when I look back at how much was accomplished in those months, I marvel that this isn't a three-year report!

In 2017, we welcomed new staff, hosted the fifth biennial Smithsonian Digitization Fair (two of them actually…),* ramped up new programmatic efforts in Impact and audiovisual mass digitization, 3D scanned a Space Shuttle, mass digitized our two-millionth object, hosted over 100 visitors in our offices or at our scanning/digitizing sites, trained 40+ staff and partners on digitization best practices, attended 11 professional conferences, and gave a dozen professional papers/presentations. We even co-authored a scientific publication (with our colleagues in OCIO Research Computing and NMNH Botany Department).

Perhaps the most critical thing we did was create a department strategic plan to serve as our guidepost from 2018 to 2021. Our vision of "Discovery through Digitization" aligns with key goals in the Smithsonian's Strategic Plan to engage more people through a "digital first" strategy.

For DPO, digitization is the crucial first step in that strategy. It provides the raw materials for sharing our collections, research, and educational resources with the world, thereby opening the door for greater impact with audiences. But we are remiss if we stop here. We also must ensure that our digital assets are easy to use, embedded with rich information and context, and are available on platforms that our audiences wish to use.

So, our mission-partnering with others to increase the quality, quantity, and impact of digitized collections – is critical. Note that the first word in this statement is "partnering." If DPO can boast even a modicum of success, it is due to our partnerships – with Smithsonian units, the technology sector, and external colleagues and institutions. In these cash-strapped times, and with quickly evolving technologies, the only way we accomplish anything is through collaboration.

With that in mind, DPO thanks all the partners we worked with in 2017, and invites everyone to learn what we are doing as we head into 2018 (some hints, in acronym code: IIIF, AI, VR, AR, OA, LOD, DH, and more…)

Diane Zorich
Director, Digitization Program Office, OCIO

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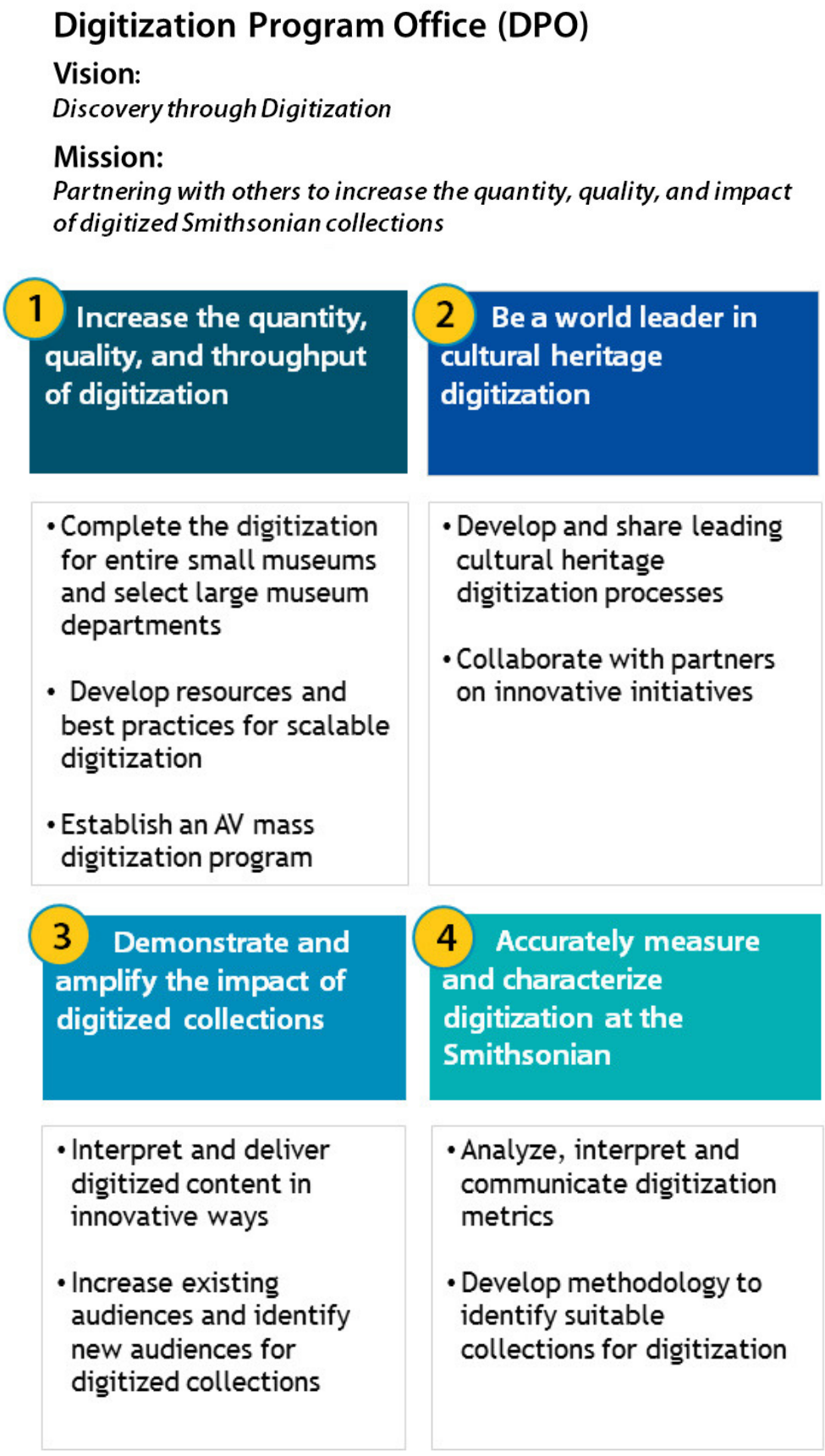
*The Digitization Fair originally was scheduled in March of 2017, but a snowstorm forced its cancellation. DPO held an impromptu "mini-Fair" for speakers and guests who arrived in Washington DC before the closure announcement. The Fair was rescheduled and took place ("rebooted") in October of 2017.

STRATEGIC PLAN 2018-2021

An important development for our office in 2017 was the creation of our strategic plan, which will guide us over the next three years as we work toward implementing key goals in the Smithsonian's larger Strategic Plan. Components of our plan are summarized here:



News from Our Programs in 2017

Our One Millionth Digitized Botanical Specimen

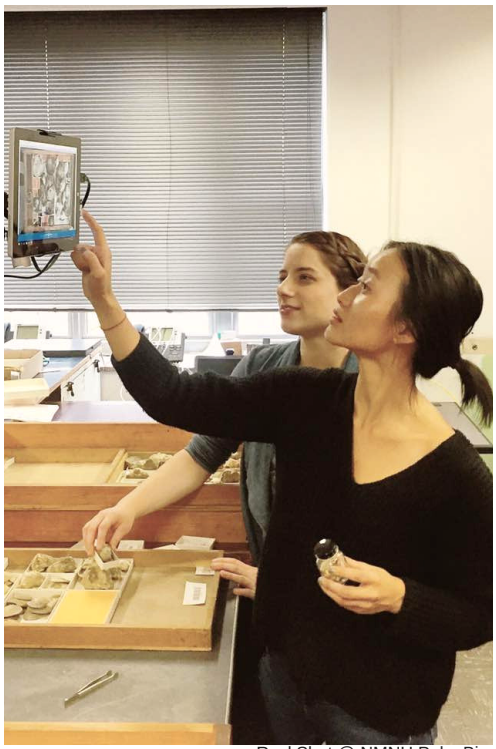
Image of Fossilized invertebrates from Paleobiology's Mass Digitization Project

MASS DIGITIZATION

The mass digitization program reached two digitization milestones: it digitized its one millionth botanical specimen sheet and its two millionth object (an orchid from Smithsonian Gardens.) We also launched a production project to digitize one million fossils from the Cenozoic era that are part of the Paleobiology Department collection at the National Museum of Natural History. This project is part of a larger digitization effort: the NSF-funded Eastern Pacific Invertebrates of the Cenozoic Collaborative (EPICC), to digitize one million fossils across the United States and enable greater research into this critical era, a time of great climate change and speciation.

The program also launched a four-year initiative to digitize the collections of eight Smithsonian history, art, and cultural museums. This “Many Museums X Mass Digitization” effort began with a pilot project to digitize the Meserve/Matthew Brady glass plates collection at the National Portrait Gallery, and a production project with Smithsonian Gardens to digitize over 7000 orchids from their collection.

The mass digitization program strives for greater efficiencies in digitization. To that end, it developed several innovations that support its work. “Rock Shot,” for example, is a simple tool that allows the Paleobiology project’s mass digitization team to correctly reassemble fossils within their storage drawers after individual specimens have been digitized. An invoice reconciliation tool was developed to help the mass digitization team reconcile vendor monthly invoices with project deliverables. And a transcription framework tool was created to help team members track and communicate the status of transcription batches.



RockShot @ NMNH PaleoBio

Meserve Collection @ National Portrait Gallery

Orchids @ Smithsonian Gardens

3D DIGITIZATION

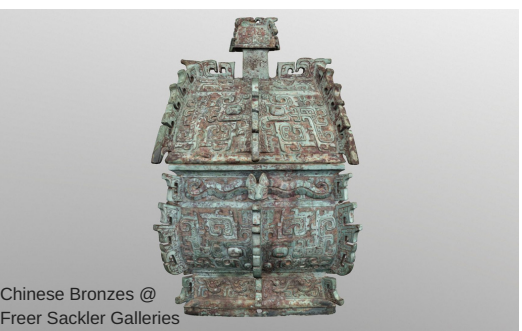
The 3D program finalized the capture phase of the Space Shuttle Discovery, taking over 30,000 images that now await post-processing. The 3D team also scanned a collection of sculpted busts for NPG's America's Presidents Exhibit (models are browsable in the Smithsonian 3D viewer and available to download: https://3d.si.edu/browser/NPG-Presidential-Portraits.

In 2017, the 3D program made a strategic decision to move away from scanning single iconic objects (which is resource intensive) towards developing a plan for scaling up 3D capture and processing of entire collections. To accomplish this goal, the 3D program is developing infrastructure which ensures that the 3D datasets captured will be sustainable in the long term. To that end, the program team is conducting pilot projects to push innovation in ways that will allow us to scale up, while simultaneously building infrastructure that will allow us to more efficiently process, store, sustain, and deliver the large datasets that 3D captures generate.

The pilot projects conducted by the team in 2017 included test scanning of Chinese bronze objects at the Freer Sackler Gallery, paleobiology specimens from NMNH and ivory tusks from the National Museum of African Art. These pilots explored the feasibility of reducing 3D capture and post-processing time. The team also began developing a Smithsonian 3D repository (in collaboration with OCIO's Research Computing team) to store the Institution's 3D datasets, as well as 3D metadata standards (in collaboration with a pan-institutional DPAC 3D subcommittee working group, Duke University, and Indiana University) to support the sustainability of photogrammetry captures. The team now is developing a workflow (that will include the repository and metadata standards) to automate 3D capture, post-processing, delivery and viewing.

Other efforts to build more robust 3D infrastructure included launching a 2.0 version of the Smithsonian 3D Viewer (in collaboration with Autodesk), and creating an EDAN layer to store annotations, articles, and storis associated with various 3D models. These efforts will take the Smithsonian a step closer to being 3D-viewer agnostic, a goal that will ensure the Institution's 3D assets can be viewed on any viewer a user chooses. This effort furthers the goals of the Institution's Strategic Plan, which calls for greater efforts towards making Smithsonian assets available to users where they are, and in ways they want to use them.

America's Presidents @National Portrait Gallery


Chinese Bronzes @
Freer Sackler Galleries


African Ivory Tusks @
National Museum of African Art

POLICY AND ANALYSIS

The program's signature effort is the Smithsonian Digitization Assessment, which in 2017 identified that the Smithsonian's museums had created a total of 7.2 million digital records and 3.4 million digital images. Another 18 million items have been prioritized for future digitization.

In a joint data call with the National Collections Program office, DPO has been collecting data on the Smithsonian's digitization efforts for over five years, and in 2017 we decided the time was right to revisit our assessment tools. We are working with Smithsonian Organization and Audience Research (SOAR) to survey staff who use the tools, with the goal of streamlining, refining, and revising the tools for ease of use and to elicit greater insight into digitization activities across the Institution.

The Policy and Analysis program also began examining DPO's outreach and communication activities to explore how we might better work with our various user and partner constituencies. In collaboration with a communications consultant, the entire department is re-considering how we might share information about our activities more effectively with our colleagues at the Institution, in the broader gallery, library, archive and museum (GLAM) communities, and with the technology and education sectors.

In 2017, Policy and Analysis also launched a new initiative to explore mass digitization of audiovisual materials. A recent study led by the Smithsonian Institution Archives (SIA) and the Audio-Visual Archivists Interest Group (AVAIL) laid the foundation for better understanding the breadth and range of these materials around the Institution, and highlighted their precarious nature. With this information in hand, and with the support of Smithsonian CIO Deron Burba, DPO recruited AV specialists from across the Smithsonian to help develop an AV pilot project that will examine workflows and issues involved in the mass digitization of these special materials. This DPAC subcommittee on AV Digitization continues to meet monthly to research and formulate an iterative plan for AV mass digitization here at the Smithsonian.

IMPACT

Our newest program will investigate standards, technologies, and projects that scale up the impact of our digitized collections. One such standard is "IIIF" (the International Image Interoperability Framework), an image standard that enables greater image use and sharing in Web environments. (The Smithsonian joined the IIIF Consortium this year as a founding member.) The Impact program is leading several units who expressed interest in serving as early adopters of this standard.

The program also worked with OCIO's Research Computing and NMNH's Botany Department to explore the potential of neural nets on the large datasets that the mass digitization program has created. The program will continue moving these efforts forward, and investigate new arenas (such as rightsstatements.org and linked open data) that have the potential to scale up the use of Smithsonian digitized collections.

Applications of deep neural networks to digitized natural history collections:
Using deep learning to identify mercury-contaminated specimens

DEVELOPMENT AND PARTNERSHIPS

DPO has built strategic partnerships and donor relations with leading technology companies for both its 3D digitization and mass digitization programs. Autodesk and FARO continued to support digitization generously during FY17 and are keeping us involved in the development of the next generation digitization technology. We are in discussions with Amazon and others about a technology collaboration that could be a game changer for 3D museum digitization. Partnerships like these ensure that the Smithsonian continues to be a global leader in museum digitization.

We also partnered with Google to 3D scan the Space Shuttle Discovery, combining emerging light field technology and laser scanning. Google used the scan data to create a VR experience that was launched on March 14. We negotiated a collaboration with Google Cultural Institute to jointly mass digitize an important poster collection at NMAH, work that is slated to be done in 2018. Our relationship with Picturae, a trusted vendor for mass digitization, is developing into a true partnership. As part of the Impact Program, we worked with technology partner NVIDIA to explore the potential of neural nets on the large datasets that the mass digitization program has created. We now are in discussions with Microsoft, Intel, Sony PlayStation, and Facebook about how to deliver our content to platforms used by our audiences.

Space Shuttle Discovery @ National Air and Space Museum

TRAINING

DPO's entire senior staff served as adjunct faculty for 36 graduate students who visited from Harvard University's Extension School course, "Collections Digitization and Digital Asset Management." Held over a long weekend in April, the students met with DPO staff to learn about our 3D digitization work, mass digitization processes and projects, and how we assess digitization efforts at the Institution.

Our mass digitization program also hosted the fifth workshop in its Quality Digitization Training Series. Twenty-six individuals from around the Smithsonian attended this workshop to learn about digital capture using Phase One products and processes.

On the 3D side of the house, the team conducted individual training for SI and other professional research staff at their request. 3D staff trained several individuals at NMNH including: two ornithologists on the use of structured light training for bird bone scanning; a postdoctoral fellow on the use of the Artec 3D scanner for capture of fossil whale materials; and Repatriation Office staff on Artec and photogrammetry equipment to 3D capture cultural objects for cultural revitalization efforts. We also provided photogrammetry training for researchers associated with the Jamestown Rediscovery project. Because the requests for training have increased significantly over the past year, the 3D program is setting up a formal training program through Moodle for interested SI staff. Stay tuned in 2018.

CH-CH-CHANGES

In 2017, DPO welcomed two new staff members:

Joe Conrad, 3D Specialist
Joe joins DPO from private industry, made possible thanks to generous support from Judy and Bob Huret. Having earned a B.A. in History, a B.S. in Marine Science, and an M.A. in Ancient History, Joe first used 3D technology to explore research questions in Ancient Greek and Roman naval warfare. In his spare time, he enjoys Latin dance, independent and foreign film, examining US foreign policy, and weight training.

Diane Zorich, Director
After an extensive consulting career in museums and cultural organizations, Diane joined DPO this February. Armed with a B.S. and M.A. in anthropology, her first museum job had her cobbling together UNIX systems, a trial by fire from which she emerged a believer in the potential of media technologies in museums. Having relocated from Princeton, NJ, she hopes to pick up her interest in bookbinding and collecting women's travelogues from the 18th-20th century once she finishes unpacking.

MOVES

Adam Metallo, Senior Program Manager for Impact
Having come to DPO as a 3D specialist and then program officer, in 2017 Adam assumed a new role as head of DPO's emerging Impact program, where he will lead DPO in identifying standards, technologies and programs that can scale up the use and impact of Smithsonian digitized collections. Adam has a B.S. in Psychology and M.F.A. in painting, and started his 3D career working with traditional museum model making in the Smithsonian Exhibits.

Jaap Otte, Director of Development, OCIO/DPO
Having worked with DPO on a part time basis, Jaap moved over to DPO and OCIO full-time in 2017, where he assists us in developing corporate partnerships and collaborations. Jaap has an M.B.A. from the McCombs School of Business at the University of Texas at Austin, and a joint degree in law and public administration from Leiden University in The Netherlands. When not at work, Jaap enjoys travel, collecting ceramics and life in general.

Vince Rossi, Senior 3D Program Manager
Vince assumed the role of head of the DPO 3D Digitization Program, where he supervises a staff of four plus an array of consultants, interns, and fellows. He has a B.F.A. in sculpture and has pursued Graduate level fine art study at Goldsmiths College/ University of London, England. He came to DPO from the Smithsonian's Exhibit Office, where he produced and managed an array of Smithsonian exhibits.

Special Events in 2017

DIGITIZATION FAIR

DPO organized and ran the fifth biennial Smithsonian Digitization Fair, titled "Bracing for Impact: Digitizing Collections to Change Lives." This Fair was the first to feature external speakers from cultural institutions across the U.S. and Europe, the first to be open to the public, and the first to receive sponsorship from 10 corporations that have worked with DPO in various capacities. It also was our largest Digitization Fair to date, with over 300 professionals from cultural and educational institutions and industry attending two days of keynotes, panel discussions, and exhibits. Presentations showcased examples of the impact of digital collections, as well as new strategies for creating and measuring that impact. All sessions were recorded and are available online. at: https://www.youtube.com/watch?v=Bnb54UdSU9Y

DEPARTMENT RETREATS

As DPO moved into its eighth year, the time was ripe to rethink its strategy and programs. Over the course of two retreats, the DPO team discussed its past and present, celebrated its achievements, and identified how to move forward in alignment with the Smithsonian's Strategic Plan. The key output of these retreats was our new strategic plan.

SITE VISIT: MEDIA DIGITIZATION AND PRESERVATION INITIATIVE AT INDIANA UNIVERSITY

As part of our investigation into mass digitization processes for audiovisual materials, DPO staff Diane Zorich and Jessica Warner, joined by OCIO colleagues Isabel Meyer and Crystal Sanchez, visited Indiana University's Media Digitization and Preservation Initiative. IU's work in AV mass digitization is widely seen as a "state-of-the-art," and they have identified important ways to streamline the digitization of these often fragile and complex materials. Like the Smithsonian, IU has highly diverse AV materials dispersed around multiple physical locations. Their workflows, testing protocols, and digitization strategies offer best practices that we will emulate as we move forward in this area.

SMITHSONIAN NEXT – REGENTS' TECHNOLOGY EVENT

The 3D team helped plan and identify some of the technology companies (Autodesk, Microsoft, Google, Facebook and Sony) to bring in to this event, which was organized by the Regents' Office. The team also exhibited the Apollo 11 Command Module "Columbia" scanning and VR experience with our partners at Autodesk.

NEWS FROM OUR ADVISORY COMMITTEE:

Digitization Program Office Advisory Committee (DPAC) members advise the DPO about its programs and plans. Members serve a three-year term and are drawn from around the Smithsonian, representing all units and every type of profession that exists across the Institution. In 2017 we said goodbye to the following DPAC members who had completed their terms:

Marjee Chmiel, SSEC
Gwyneira Isaac, NMNH
Robert Leopold, CFCH

And welcomed new members, who will serve until 2020:

Ginny Gomez, OGC
Effie Kapsalis, SIA
Beth Stern, OCIO Research Computing

DPAC also serves as a home for a number of special interest subcommittees, led by DPO staff or DPAC members. These subcommittees serve as working groups to explore topics or participate in projects that require specialist knowledge. In 2017, four new DPAC subcommittees were formed:

- Audio-Visual Mass Digitization Subcommittee (**Jessica Warner, Chair**)
- 3D Digitization Subcommittee (**Vince Rossi, Chair**)
- 3D Metadata working group (**Jonathan Blundell, Chair**)
- IIIF Subcommittee (**Adam Metallo, Chair**)

DPO COMMITTEE WORK

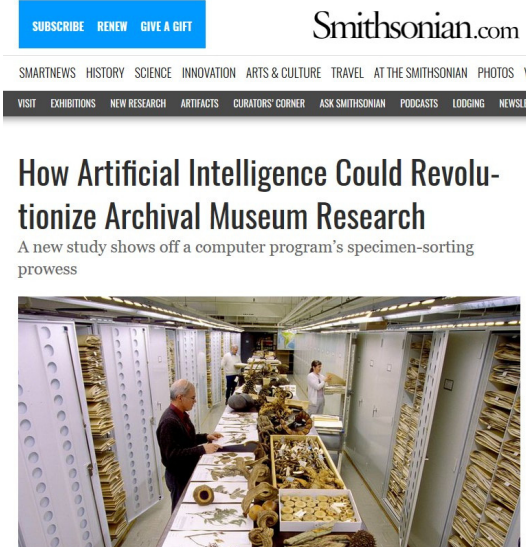
In 2017, DPO staff served on several Smithsonian committees, bringing our insight, expertise, and support to bear in the following groups:

- Smithsonian Strategic Plan Implementation Team 3 (“Reach a Billion People through a Digital First Strategy”)
- Office of the Undersecretary for Finance and Administration (OUSFA) Retreat
- Collections Information System (CIS)-IRM Pool Fund Allocation Committee
- Smithsonian GUID Working Group
- SI Strategic Plan Collections Panel
- Collections Information Management Committee (CIMC)
- Smithsonian Institution Archives & Special Collections Council (SIASC)

VISITORS

DPO welcomed over 100 visitors from Australia, Saudi Arabia, Japan, Europe (Denmark, Netherlands, Germany, UK) and the US, arranging site visits to talk to DPO staff about our work and processes and to tour our lab and digitization sites in action. We also hosted colleagues from around the Institution as well as staff members from the U.S. House of Representatives Administration Committee.

DPO in the News...



SEVERAL OF OUR PROJECTS RECEIVED EXTERNAL NEWS COVERAGE...

Here is how you photograph a million plants without losing your mind. Sarah Kaplan. Washington Post. https://www.washingtonpost.com/news/speaking-of-science/wp/2017/02/08/this-is-how-you-photograph-a-million-dead-plants-without-losing-your-mind/?postshare=8601486571203755&utm_term=.c68285ad2a42

How Artificial Intelligence Could Revolutionize Archival Museum Research, Ryan P. SMith, Smithsonian.com Read more: https://www.smithsonianmag.com/smithsonian-institution/how-artificial-intelligence-could-revolutionize-museum-research-180967065/#HHhitliWXy0yST5f.99

Neural Nets Identify Natural History Collections with Almost Perfect Accuracy. Hilary Lamb, Engineering & Technology. https://eandt.theiet.org/content/articles/2017/11/neural-networks-identify-natural-history-specimens-with-almost-perfect-accuracy/

The Smithsonian Design Museum Digitizes 200,000 Objects, Giving You Access to 3,000 Years of Design Innovation & History http://www.openculture.com/2017/09/the-smithsonian-design-museum-digitizes-200000-objects.html

Applications of deep convolutional neural networks to digitized natural history collections https://bdj.pensoft.net/articles.php?id=21139

Local news coverage of Space Shuttle Discovery scan: http://wtkr.com/2016/10/27/smithsonian-creating-3d-scans-of-space-shuttle-discovery/

Smithsonianmag.com article: This Replica of a Tlingit Killer Whale Hat Is Spurring Dialogue About Digitization (https://www.smithsonianmag.com/smithsonian-institution/replica-tlingit-killer-whale-hat-spurring-dialogue-about-digitization-180964483/

SOCIAL MEDIA STATISTICS

OUTREACH

DPO freely shares its processes and work products with our colleagues across the Smithsonian and in the broader GLAM community through social media streams, our web sites, YouTube videos, and professional presentations.

258,729

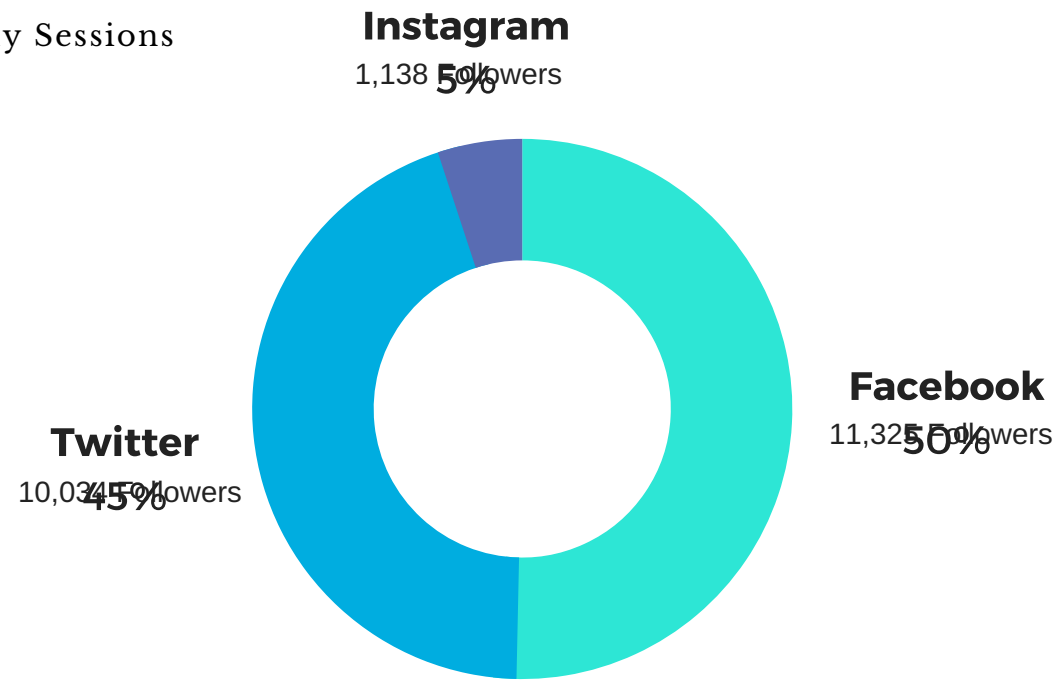
YOUTUBE VIEWS

95 Videos
277 subscribers to our channel

305,146

TOTAL SESSIONS
VIA OUR WEBSITES
DPO.SI.EDU & 3D.SI.EDU

21,054 Visitors
25,429 Average Monthly Sessions



TRENDING IN DC

THE SMITHSONIAN
DIGITIZATION FAIR

Twitter's "Trending in DC" category during the two days of the fair

A SPECIAL NOTE - OUR OCIO PARTNERS

DPO is an office in the Smithsonian's Office of the Chief Information Officer.
Our colleagues in OCIO provided unbridled support for our programs in 2017, as they do every year.

We are particularly grateful to the following divisions and branches:
Network and Voice Services, Network Security, Desktop Services, DAMS Support, the Help Desk, Research Computing, System Architecture & Product Assurance, Collections System Support and Libraries & Archives System Support.

Special thanks to the Technical Plans, Policies and Project Management branch, who ease our way through Federal policies and procedures, and to Jeanette Winget, who keeps the ship on course.

Smithsonian
DIGITIZATION PROGRAM OFFICE