



SOLAR DECATHLON DATA MANAGEMENT

Curating the digital legacy of Team Maryland

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UNIVERSITY LIBRARIES

Introduction

The Solar Decathlon is a series of international competitions for student teams based on an initiative of the U.S. Department of Energy (DOE) in 2002. In these competitions, universities from all over the world are challenged to design, build, and operate solar powered houses. Thirteen competitions have been conducted worldwide up to 2017 gaining a great deal of experience, with new ones already being planned. As a multidisciplinary challenge requiring expertise in engineering, architecture, communications, performance, and energy, the competition requires each team to take a unique approach to technology integration in their target markets.

While more than 500 books, theses, reports and articles have been written about the individual competitions in its fifteen years of existence, to date there has been no systematic archiving of the research, scholarly, and creative work created by these competitions. Patricia Cossard and David Durden (DSS) are working with the DOE (all competition deliverables/documents have recently been transferred from National Renewable Energy Laboratory (NREL) to DOE with no developed maintenance plan), the Organisation for Economic Co-operation and Development's (OECD) International Energy Agency (the Solar Decathlon Knowledge Base (SDKB)), and Team Maryland to develop a data management standard and best practices for data archiving and curation to dissemination internationally to all teams and agencies, past, present and future.

Team Maryland has participated in the 2002, 2005, 2007, 2011, 2017 DOE competitions. It is currently competing in the Solar Decathlon Europe 2019 as a joint collaboration between the University of Maryland, College Park (UMD), Moholy Nagy Art and Design University, Budapest (MOME), and Óbuda University (OU).

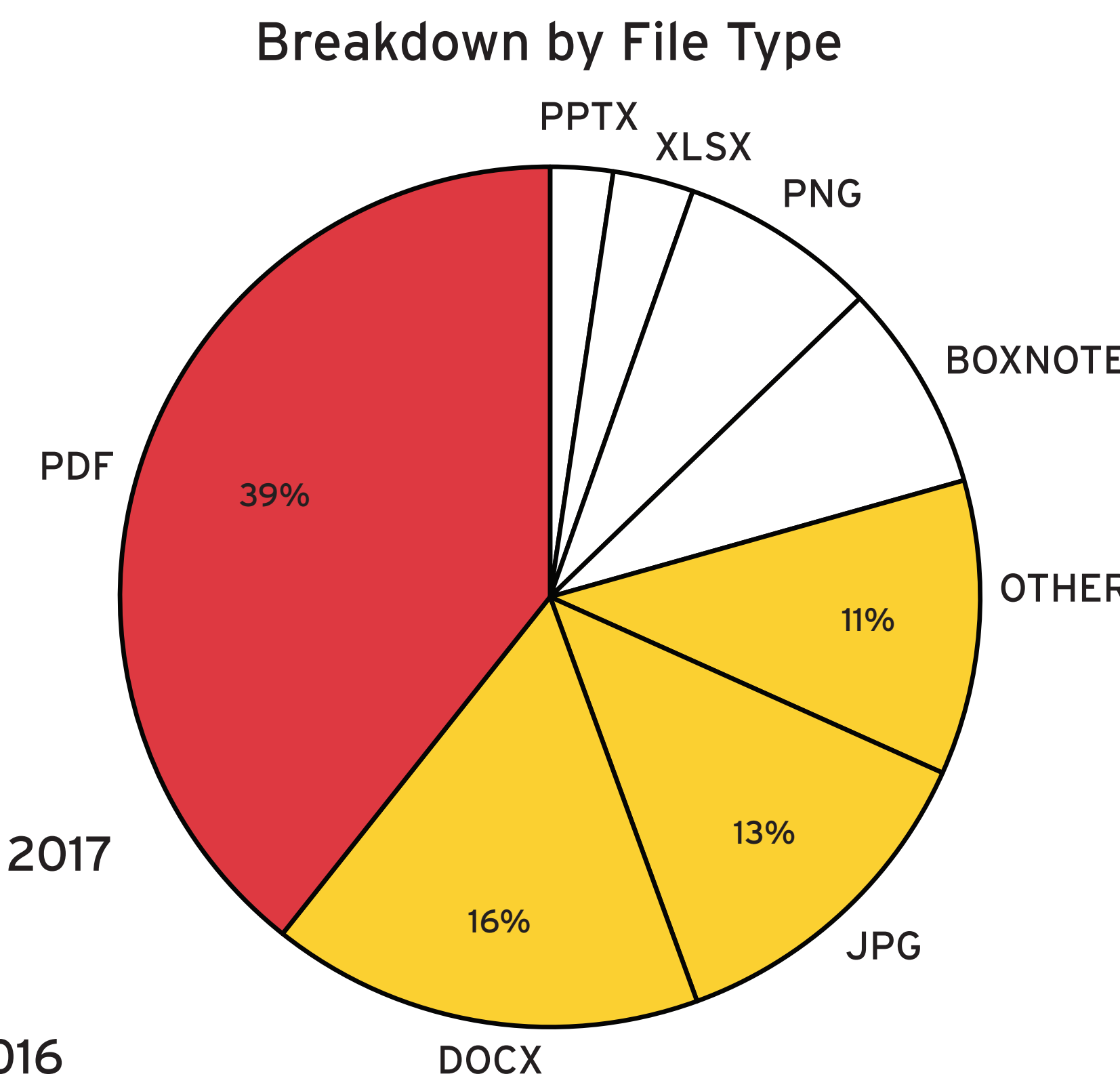
Digital Curation

Every Solar Decathlon team generates high value documents and data during the course of the project, and these outputs should be stewarded by the UMD Libraries. The ideal repository solution for Solar Decathlon materials is the Digital Repository at the University of Maryland (DRUM). The Solar Decathlon will have its own community in DRUM which will in turn contain collections of Solar Decathlon materials organized by year.

Each collection will be structured the same way using similar naming conventions for both files and landing pages, document type descriptions, metadata, and biographical and contextual language. The landing page for each project will feature information about that year's Solar Decathlon competition, a complete list of participants, sponsors, and advisors, and external links to DOE Solar Decathlon and Team Maryland webpages. Individual files to be included in each collection will contain the complete competition deliverables and supplementary materials including images, video, parts and materials manifests, architectural plans, animations and rendering .cad files.

Facts & Figures

- 3, 976 files
- 21.3 GB stored in Box Cloud
- 65 unique files types
- 400 + individuals with access
- Coverage dates range from 2002 - 2017
- Data management team created 2016



Data & Records Management

Solar Decathlon projects are complex and produce a wide range of documents that require careful management. Solar Decathlon projects at UMD involve hundreds of individuals engaged in intense collaborative work that includes coursework, funded research, and federally-sponsored competitions. Team Maryland's advising faculty recognized the need for data management in 2007 when the Libraries first supported the Team. However, not until Summer of 2016 was a formal data management plan initiated. The initial plan was rudimentary and didn't include strategies for sharing and dissemination of data and research outputs that insure attribution to UMD.

Leb by the UMD Libraries, all future Solar Decathlon projects at UMD will have a framework within to strategically plan and archive content. As the processes and outputs of Team Maryland were under review, the need for a formal records retention schedule became apparent. Project and administrative records for Team Maryland are covered under the University of Maryland Records Schedule and these retention guidelines will be consolidated into a records retention policy for Team Maryland.

The Solar Decathlon project at UMD relies upon ongoing library support. The collaborative efforts that make Solar Decathlon possible at UMD can serve as an example for increasing the Libraries' visibility on campus through direct participation and support for ongoing research and projects. The Libraries can increase their presence in interdisciplinary research on campus through direct data management and digital scholarship activities. One goal of this project is to develop a framework for enhancing direct library collaboration and digital scholarship support.

Building a Community of Practice

The Solar Decathlon is both a national and international competition and the results of each competition have both educational and market value. Team Maryland has already been invited to include project data by the OECD funded Solar Decathlon Knowledge Base (SDKB) project, whose objectives include: establish an international collaboration platform for competitions in the buildings sector, strengthen the dissemination activities of the International Energy Agency Technology Collaboration Programs concerning buildings-related R&D, expand the role of competitions as testing grounds for innovative methods, tools and systems, with strong links to the scientific community and academia, raise public visibility of energy R&D policy working towards climate neutral habitation, and provide case studies on the building and district levels.

While the mission of the Solar Decathlon, Team Maryland, and other participating teams is to educate and innovate, the hard work of the participants should be released in a manner consistent with other research products to encourage attribution and credit for both the individuals and the partnering institutions. The work of developing rigid data management workflows for Solar Decathlon projects at UMD will be shared with other participating universities and with the DOE. Prior to the release of data management methodologies developed at UMD, a survey will be conducted of previous participating teams to discover what, if any, data management protocols were employed and what curatorial efforts the teams took to preserve their work.

Work & Challenges

What we've done. The library-led data management project has surveyed the existing documents and organization for Team Maryland. From this survey, a formal data management plan and a records retention schedule has been proposed. Digital curation activities have been initiated and the arrangement of Team Maryland materials in DRUM has been approved.

What we're doing. Digital curation activities are ongoing throughout the summer and fall of 2018. Materials will be added to DRUM beginning with the most recent Solar Decathlon (2017) and previous competition documentation will be added incrementally in reverse chronological order. In coordination with the iSchool's field study program, students will begin generating metadata and organizing files in preparation for ingest into DRUM. The student assistants are also preparing to conduct the survey of other participating universities and colleges data management and digital curation activities related to Solar Decathlon.

Challenges. The upcoming 2019 Solar Decathlon Europe will be the first to begin with formal data management policies in place. The first year of implementation will require ongoing review and refinement of data and records management workflows to ensure effectiveness and completeness. Consent is required from all participants to deposit materials into DRUM since these materials will be visible to a global audience. Acquiring consent to deposit materials does not pose an issue for current and future Solar Decathlon teams; however, acquiring retroactive consent from individuals from previous events may prove difficult.

Timeline of Solar Decathlon Events for Team Maryland

2016			2017		
Spring	Summer	Fall	Spring	Summer	Fall
<ul style="list-style-type: none"> • Team Maryland get seat in competition • 5 related courses supporting initial design development • New Gemstone Team created • Website 1.0 released • DOE deliverables submitted: <ul style="list-style-type: none"> • D1: Team Short Description & Project Management Plan • D2: Schematic Design Summary 	<ul style="list-style-type: none"> • Gemstone Team continues project on water filtration • Data Team created, drafts Data Management Plan • Central file storage implemented • Communication and social media channels developed 	<ul style="list-style-type: none"> • 6+ related courses offered supporting architectural designs, energy modeling, and smart house open source systems • LMG approves Library support to Solar Decathlon as Information Hub • \$186.5K in sponsored research funds granted • DOE deliverables submitted: <ul style="list-style-type: none"> • D3: Team Overview • D4: 90% Construction Documentation • D5: Project Digital/Visual Representations • Gemstone Team continue water filtration design • Student Leaders (15) receive research stipends to continue development of construction documentation 	<ul style="list-style-type: none"> • 7+ related courses offered • Team website 2.0 released • DOE deliverables submitted: <ul style="list-style-type: none"> • D6: 100% Construction Documentation • D7: Project Summary & Public Exhibit Materials 	<ul style="list-style-type: none"> • Construction begins at Anacostia building site • Team website 3.0 released • DOE deliverable submitted: <ul style="list-style-type: none"> • D8: Jury Narratives, As-Built Construction Drawings, Audio-Visual Presentation 	<ul style="list-style-type: none"> • October 4-14: Competition runs, 45 decathletes provide tours to thousands of visitors; Team Maryland takes top U.S. University seat overall • Data management & curation planning begins • Final DOE deliverable submitted: <ul style="list-style-type: none"> • D9: Final Project Report