Geant4-papers

Dmitri Konstantinov

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Motivation for a Geant4 Repository

- **Current State:**
  - Papers, presentations, and important documents related to Geant4 are scattered across various places.
  - No centralized repository exists to easily search, access, and link relevant content.
- **Challenges:**
  - Lack of organized storage leads to difficulties in finding important resources.

Proposed Solution

Inspiration:

- Based on the successful **CMS ECAL Plot Repository**, created by Grigory Latyshev, Federico Ferri (CEA, Saclay), and me.
- The repository has been running since **2021** without major interventions and is a **static site** hosted by CERN IT.
- Check the CMS ECAL Approved Plots

How It is Used in CMS:

- CMS has several **Detector Performance Groups (DPGs)** (e.g., HGCAL DPG, ECAL DPG, HCAL DPG), responsible for detector-related studies.
- Results must pass through the **DPS Approval** process before being shown at international conferences.
- Subsystems store "approved"plots in dedicated repositories, with correspondent associated metadata (title, date, tags, caption).
- An **Angular-based website** allows filtering of plots based on session names and tags.

Create a Similar Application for Geant4 Papers

- Instead of plots, users will filter **PDF files** containing **Geant4-related papers**.


```
{
    "title": "Experience in using Geant4 on the GRID",
    "authors": [
        "Alberto Ribon", "Giovanni Santin", "Witold Pokorski"
    ],
    "original_link": "https://indico.cern.ch/event/199138/contributions/378776/"
}
```


- Metadata includes **title, authors, year, links** to Indico records or journals, and relevant **tags**.
- **PNG files** of the first page of presentations will be stored alongside PDFs to enhance the visual appearance.

Key Features

- **Static Site for Reliability:** The application will be static for easier maintenance and deployment, like the CMS ECAL repository.
- **Metadata Support:** Each document will include metadata like title, authors, date, and tags.
- **Search & Filtering:** Users can search and filter based on tags - physics area, authors, and year.
- **User-Friendly Interface:** Built with Angular and optimized for both desktop and mobile use.

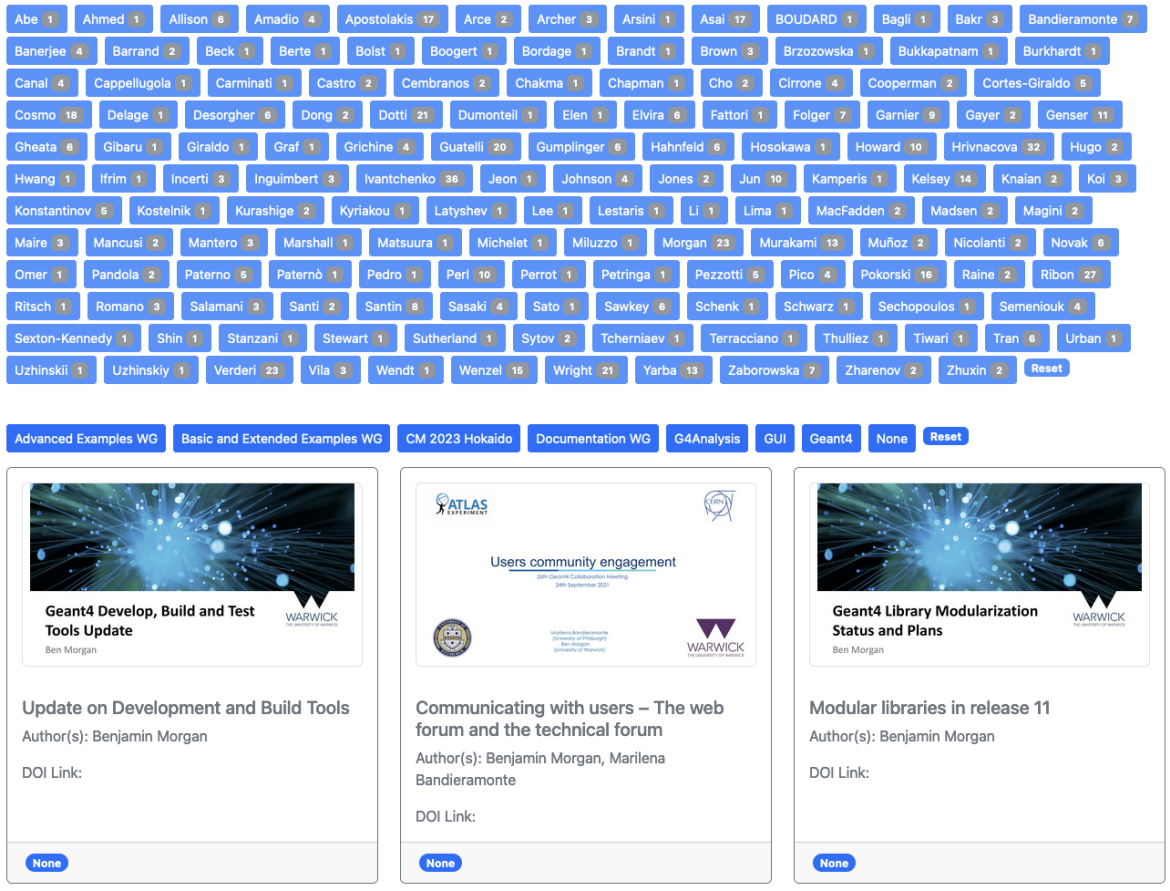
Technology Stack

- **Static Site with Angular:** The site will be built using Angular, with the final output being fully static files.
- **Apache Server:** The static files will be served using a standard Apache server.
- **CI/CD Pipeline:** Automated deployment using GitLab CI for continuous updates.
- **Content Storage:** All papers, presentations, and metadata will be stored in GitLab repositories, utilizing Git LFS for large files.

Workflow for Users, same as geant4.cern.ch

- **Submit:** Users clone the repository, add their paper or presentation, and commit it along with its metadata.
- **Merge Request:** Create a merge request to update the repository.
- **Deployment:** Once approved, the content is automatically deployed and available on the website.
- **Accessibility:** All content can be searched and accessed via the web interface, with options for downloading.

First Prototype of the Geant4 Repository



- Python script was written to download all PDF files from Geant4 collaboration meetings of 2011-2013, 2020-2023.
- Spent a day developing the first prototype of the website.
- The prototype is far from fully functional version but demonstrates that the solution should work.

Conclusion & Next Steps

- **Impact:** A centralized repository for Geant4 resources will simplify access to important papers and presentations.
- **Next Steps:**
  - create the **Geant4-papers** repository following the accepted structure and start populating it.
  - gather requirements from **Geant4 members** to ensure the repository meets the Geant4 community's needs.
  - Begin development using the same approach as the CMS ECAL repository.