Looking to the Future: Proposal to Upgrade itsoc.org
Brian Kurkoski, Online Committee Chair, IEEE Information Theory Society
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Our website itsoc.org is the core of the Society's online presence. Web technologies and how we communicate online are rapidly evolving, such as the increased importance of video. Conferences and workshops are now rapidly moving online, and this will persist even in the post-COVID era. Our current web platform has been expensive to maintain and difficult to add new features. To support the Society's goal of being outward facing towards other disciplines, industry and the general public, and to better serve our members, the website itsoc.org must be upgraded.

The Online Committee proposes to upgrade the Society's website itsoc.org. This proposal is to “preserve and extend:” features and data from our current site will be preserved and migrated to the new site. Increasingly rich features are proposed in Plans 1–3 in Table 1. Competitive estimates provided by developers is in a separate document. The new platform is Drupal, a major web content management systems (CMS), which has a large developer community, great extensibility and a promising future. The new site is planned to go live on January 1, 2021.

Background

The current version of itsoc.org began around 2007. Our site was developed by Six Feet Up (SFU) on the CMS platform Plone. At that time, these choices made sense. However, the recent ongoing costs of maintaining our website itsoc.org have been high. A major reason is that our current site has a lot of custom code. In 2018, the BoG approved $70k to upgrade from Plone 4 to Plone 5. In 2019, SFU could not complete the upgrade and asked for $30k to $33k more to complete this upgrade. The Online Committee did not request this budget from the BoG, thinking that it is prudent to consider other approaches.

At the February 2020 BoG meeting, the Online Committee reported that it would be investigating moving itsoc.org to a new platform. Those investigations were performed, resulting in this proposal.

In May 2020, the future of the information theory society (FITS) initiative began. This proposal contains inputs from FITS meetings.

The past Online Committees, particularly the past chairs Nick Laneman, Matthieu Bloch and Anand Sarwate, did mountains of work to build our website, and they deserve a big thanks. If this proposal is accepted, we will be ending a 13-year relationship with SFU, but the work of past Committees will be preserved as the new site will inherit the great ideas and structure that they built.
Table 1: Hierarchy of plans for upgrading itsoc.org. Each plan is increasingly feature-rich, and increasingly expensive.

<table>
<thead>
<tr>
<th>Plan</th>
<th>Description</th>
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<tbody>
<tr>
<td>Plan 0</td>
<td><strong>Upgrade to Plone 5.</strong> Do not change developer and stay with Plone. Existing site remains mostly unchanged. Security and stability improvements for the current web site. Future improvements remain expensive.</td>
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<tr>
<td>Plan 1</td>
<td><strong>Migrate to Drupal.</strong> New website; existing data and features are migrated from existing site. General improvements, but no new features are added. Existing design is copied. Comparatively easy to add features in the future.</td>
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<tr>
<td>Plan 2</td>
<td><strong>New Look and New Features.</strong> Plan 1, plus:</td>
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<td>- A fresh, new look for itsoc.org using modern design approaches.</td>
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<td>- A new section for videos, a library of both Society-produced videos and member-submitted videos. A new section for the Distinguished Lecturer Program.</td>
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<td>- Provide new member benefits such as video of seminars and talks, jobs mailing lists.</td>
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<td>- Improved announcements, email and social media integration.</td>
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<td>- Various much-needed improvements: improved posting of announcements, Mailchimp integration, easy BoG meeting uploads, improve site organization.</td>
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<tr>
<td>Plan 3</td>
<td><strong>Microsites for Journals and Schools.</strong> Plan 2 plus: Host sites for Schools, JSAIT, Transactions, chapters, IT Magazine and other special-focus sites (e.g. WITHITS) using distinctive microsites, sites-within-a-site.</td>
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Upgrade itsoc.org: Plans and Their Features

Three plans of increasing features and increasing cost are summarized in Table 1 and details are below.

Plan 1: Migration to Drupal

The existing web site itsoc.org will be moved to Drupal, preserving its features and data, but no new features are added. For roughly the same cost as upgrading Plone, we can get a site with similar functionality, but without the features of Plans 2–3.

In order specify the functionality of our new web site, the Online Committee built a site that replicates the existing features of itsoc.org. The Online Committee is also responsible for migrating data from the old side to the new site. The developer will provide consulting to
professionalize and prepare it for theme building. This site is passed to the developer which will build a theme, which will give the site a look fairly similar to the current site.

**Plan 2: New Look and New Features**

**New look for itsoc.org**

- The new website will have an elegant design becoming the Information Theory Society.
- The landing page will be reorganized, with increased focus on the technical contributions of the Society.
- The Online Committee has been surveying similar sites (e.g. sister societies; some nice examples include Computer Society, Signal Processing Society and CAS) for inspiration.
- See sketches for the new site at the end of this document; these are input to the developer.

**New Section for Videos**

Video is becoming an increasingly important means for disseminating technical knowledge, particularly to young researchers. The Society produces a large amount of video such as plenary sessions at ISIT, presentations at Schools and the Art of the Problem videos.

- An innovative new videos section will bring together and highlight recent videos from both the Society and members.
- Member-submitted videos can be added after approval by Online Editor. In the COVID era, members have been created many videos that they may want to share. itsoc.org will be a hub for information theory-related videos.
- Videos will be tagged and organized: e.g. ISIT, Plenary, DLP, Art of the Problem, Undergraduate, Education, Technical Talk, Polar Codes, etc.
- Video hosting will be on YouTube, Vimeo etc. and embedded on our site.

**New Section for Distinguished Lecturers**

Promote the Distinguished Lecturer Program with its own landing page. DLPs promoted with portraits, presentation PDFs and video.

**Member Benefits Using IEEE Single-Sign On**

The new site will provide member benefits as an encouragement to become a member of the Society, such as:
• Access videos to seminars and talks, such as conference and school archives
• A mailing list for jobs, not only for postdocs but for industry jobs as well.
• Course resources, e.g. a forum for members to exchange course resources such as videos.

This can be achieved using IEEE single sign-on, as other societies do. IEEE appears to use SAML for authentication and Drupal has a SAML module. The Online Committee has contacted Priscilla Amalraj and Sampath Heragu at IEEE; currently waiting for a response.

Improved Announcements, Email and Social Media Integration

• Members will continue to be able to post news and events to the website and mailing list, but with an improved and easy-to-use interface. This addresses a common complaint about the current website.

• Unify existing mailing lists such as “announcements” and “Shannon movie,” while adding new ones such as “jobs.” Members manage their mailing list subscription preferences from itsoc.org using Drupal’s Mailchimp module.

• Improved social media integration. Increase our activity on Twitter and Facebook by posting suitable items (e.g. promotion of papers) that are too minor for mailing list announcements.

Various Much-Needed Improvements

• Improved Meeting content type so that BoG members can easily upload their own PDFs for the BoG meeting. Tag uploaded reports with committee name to make lists such as “all reports of the Membership Committee.”

• Clear documentation with short descriptions of how to perform basic tasks (How to edit my microsite? How to add a committee member? etc.).

Plan 3: Microsites for Schools, JSAIT, Transactions, Chapters, etc.

We propose to unify websites for various activities of the Society that are currently distributed across various small and disparate websites. Microsites are sites-within-a-site that appear independent of the main site, but share the same host under the hood. Each microsite is visually distinct and has its own menu, while having common design elements that form an “IT Soc Brand,” visually connecting the Information Theory Society activities. URLs like jsait.itsoc.org or esit-2022.itsoc.org are possible.

The new microsites will be easy for responsible persons to edit. Possible microsites:
**JSAIT and Transactions**  Our new journal JSAIT will get a new website design. A “featured papers” section promotes papers hand-selected by the EiC each issue (see e.g. the top of *Nature Biological Sciences*). Use images from the journal to promote each issue. Current site: http://itsoc.org/jsait/

With the EiC’s consent, Transactions can also be a microsite, and use a template similar to JSAIT. The Transactions tables of contents is already emailed to members, this could be put on the website as well. Current site http://trans-it.ece.umd.edu/

**Schools**  Each School shares a common template, customized with a unique image and color scheme. Year after year, this will provide a consistent look for the schools, while being visually connected to the IT Society. The template could be a minor variation of the JSAIT template, or it could be similar to https://www.inue.uni-stuttgart.de/ or https://shannon.engr.tamu.edu.

**Other Special-Purpose Microsites**  Special-focus activities that need a website, for example Society chapters and WITHITS, can be provided with a microsite. Since we cannot predict future needs, a general-purpose template is provided, with some limited ability to change the image and colors.

Note that our current Plone site has a microsite feature, but the design is not distinguished from the main site, leading to confusion. In the new site, microsites will be independent and look visually distinctive from the main site itsoc.org.

**Migration Plan**

In addition to new features, most existing features will be preserved and improved:

- itsoc.org houses the rich history of the Information Theory Society, e.g. BoG members going back to 1990, which should be preserved. Matt has been diligently keeping this information up to date, while adding historical data as well. Thank you Matt! Your work will be preserved.

- User data, member profile pages*, committees, awards, pages, files, links, news/events, meetings and conferences will be migrated to the new site. Certain stale and non-public items will not be migrated. Older versions of existing content will not be migrated.

- *If IEEE single-sign on is implemented, profiles of non-members may not all be migrated.

- The current site has become disorganized over the years. In the process of migration, we will clean up the organization of content, placement on menus, etc. Will request assistance from chairs of the Conference Committee, Membership Committee and Publications Committee to clean up content in their respective areas.
• The Online Committee will act as the interface between the old developer and new developer (two developers talking directly to each other is a recipe for cost overrun). Drupal and Plone structure data in comparable ways, making data migration straightforward, e.g. move data using CSV or JSON files.

Why Drupal?

• Drupal is an open-source content management system with more than 1 million installations http://drupal.org, and is the fourth-most popular CMS system https://w3techs.com/.

• Drupal has a flexible and extendible structure that can accommodate many types of content (e.g. Committees, Awards, Meetings, Videos, talks/sessions for conferences).

• There is a large and active community of open-source developers. They have created many Drupal modules, some of which could be used to add features to our site, such as the MailChimp module (our mailing list is based on Mailchimp), Google Maps for the map of IT Soc chapters and exporting an iCal calendar feed of events.

• There is a large number of Drupal website developers, making it possible for us to change developers without too much difficulty, in the event we are unhappy with our current developer (this was not the case for Plone). https://www.drupal.org/drupal-services

• In the 2010s battle of the CMSs, Drupal was one of the winners, Plone was not so much. By moving to Drupal, we are choosing a sustainable platform for the long-term.

• Why not WordPress? WordPress has 63% of CMS market share, and can provide static content, forms and mailing list. But it is not so great for video integration, profile pages, committee lists. The main expense is the design/theme, which is about the same for both Drupal and WordPress. Plone to Wordpress migration is difficult because it lacks the “content type” structure that Plone and Drupal have.

Schedule

• August 1, 2020 — SFU provides data dump from current Plone 4 site.
• August 1 — Online Committee submits prototype site for evaluation.
• September 1 — Developer completes review of prototype site and Online Committee makes necessary changes. Prototype site is passed to Developer.
• November 1 — Developer provides preliminary version for review by BoG.
• December 1 — Developer completes site.
• December 15 — Plone site is set to read-only mode, no more content can be added. SFU performs final data dump.
December 31 — Data import into Drupal and final QA completed.

January 1, 2021 — New site goes live.

**Proposed Site Components for itsoc.org**

One way to measure complexity of the site is by the number of distinct components.

Possible components for itsoc.org

1. IEEE navigation bar
2. IT Soc logo header
3. Search block
4. Main menu
5. Footer
6. GDPR cookie consent
7. Left-side navigation menu
8. Left-side HTML block

Components on the landing page:

9. Slideshow
10. Static HTML with buttons: Become a member
11. Call to action, Events
12. Upcoming conferences and schools
13. Recent videos
14. Hot Topics
15. Research in Information Theory

Video landing page:

17. Large video (“How space-time codes work”)
18. Small video section (“Art of the problem”)

Video section:
19. playlist-style list of videos

DLP landing page:
20. A lecturer
21. A presentation

Profile page, see Profile page example
22. Name/portrait/affiliation/biography/contact info
23. Participation and Position
24. Author Of
25. Advisor to
26. Awards Received

Various page types for migration
27. A general page with a few images (e.g. Claude E Shannon)
28. A file, e.g. Thinking About Organizing at ITW or ISIT?
29. Committee list, e.g. Board of Govenors
30. Award person page list of people, Claude E. Shannon Award
31. Award paper page list of papers, Information Theory Society Paper Award
32. News/Event/Jobs listings, Job Openings
33. An old-style meeting with attached files, BOG Meeting @ ITA 2020, San Diego
34. A new-style meeting with paragraphs.
35. Online forms for members e.g. on Drupal or on Plone

Microsites can reuse the above components.
Codes are widely used in many engineering applications to offer robustness against noise in large-scale systems. There are several types of noise that can affect the performance of distributed machine learning algorithms: straggler nodes, system failures, or communication bottlenecks. But how can we use codes to speed up distributed machine learning?
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Ph.D Dissertation, Department of ECE at the University of Illinois at Urbana-Champaign

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by Gesualdo Scutari, Daniel P. Palomar, Sergio Barbarossa
IEEE Transactions on Information Theory, July 20XX

Speeding up Distributed Machine Learning Using Codes
Codes are widely used in many engineering applications to offer robustness against noise. In large-scale systems, there are several types of noise that can affect the performance of a distributed machine learning algorithm—straggler nodes, system failures, or communication bottlenecks—but there has been little interaction cutting across codes, machine learning, and distributed systems. Read more…
by Kangwook Lee, Maximilian Lam, Ramtin Pedarsani, Dimitris Papailiopoulos and Kannan Ramchandran
IEEE Transactions on Information Theory, March 2018

Research in Information Theory
Information Theory Videos

How space-time codes work (MIMO)
Information Theory Society presents a brief history of wireless communication (radio) leading to the idea of multiple-antenna wireless systems (MIMO) and space-time codes.

Latest Videos

The Art of the Problem

How internet communication works: Network Coding
The Beauty of Lempel-Ziv Compression
How space-time codes work (MIMO)
Hamming & Low Density Parity Check Codes
The Beauty of Lempel-Ziv Compression

The Bit Player Trailer

The Bit Player is the first feature film about Claude Shannon. The IEEE Information Theory Society has helped to produce this film, which combines interviews with leading scientists, archival film, inventive animation and compelling commentary from Shannon himself to tell the story of an overlooked genius who...

Recommended by Our Members

Elegant Compression in Text (The LZ 77 Method)
Differential entropy
Joint, Conditional, & Mutual Information
Lattice Coding for Communications
Distinguished Lecturers

The Information Theory Society established the Distinguished Lecturers Program to promote interest in information theory by supporting chapters who wish to invite prominent information theory researchers to give talks at their events. The Society aims to maintain ten Distinguished Lecturers each serving for two year terms. Typically, the ITSoc Distinguished Lecturers program provides funding for airfare and travel, and the local chapter funds accommodation and local expenses. If traveling to a different continent, visits to two locations are required. The distinguished lectures should be freely accessible to the public.

Interactive Communications

University of Texas, Austin, April 10, 2019
University of Texas, Dallas, April 12, 2019

Minimum Rates of Approximate Sufficient Statistics

University of Waterloo, June 13, 2019

Recent Advances in Ranking: Adversarial Respondents and Lower Bounds on the Bayes Risk

McMaster University, June 15, 2018
University of Toronto, June 11, 2018

On the Maximum Size of Block Codes Subject to a Distance Criterion

Taiwan, January 26, 2019

All data are equal, but some data are more equal than others

North Macedonia, March 2019

How to Measure Side-Channel Leakage

Texas A&M, October 17-19, 2019

Private Information Retrieval: How to Get Something Without Revealing What You Got

University of Waterloo, on April 2, 2018
McMaster University, on April 3, 2018
University of Toronto, on April 4, 2018

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