LA|PSE

the living archive for | process systems engineering

Stakeholder Report

Nov 21, 2019

LAPSE:2019.1135

News

The Living Archive for Process Systems Engineering (LAPSE, http://PSEcommunity.org/LAPSE) has had an amazing first year of growth. The repository holds **over 2000 submissions** and growing, averaging just under 5 submissions per day since its inception. Open-access papers remains the most popular submission, with conference presentations coming in second, peaking particularly around major PSE conferences as presenters make their slides available to their audiences.

Journal Partners

LAPSE has partnered with the journal *Energies,* our second journal partner. These partners automatically submit their open access articles into LAPSE with each published issue. We continue to seek out more journal partnerships in this way. For example, Elsevier has provided us with a convenient database of embargo date, legal disclaimer, and licensing requirements for all of their engineering journals which has been incorporated directly into LAPSE.
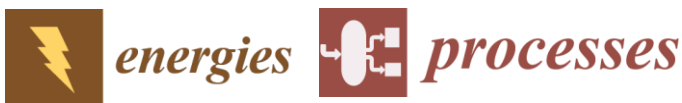
Curation and Categorization

Calvin Tsay (Texas@Austin) continues to serve as head curator. Calvin examines each submission to ensure that it has been categorized in the correct subject area, which often requires considering each abstract individually for appropriateness. This may involve creating or splitting subject areas depending on emerging trends. For example, he has recently created several new subject areas to reflect with emerging trends in Biosystems, Energy Policy, and Intelligent Systems. Calvin's work has been indispensable to the success of LAPSE. Thank you Calvin!
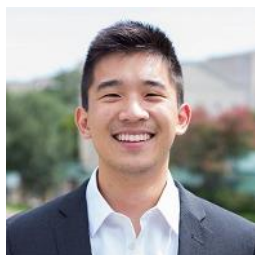
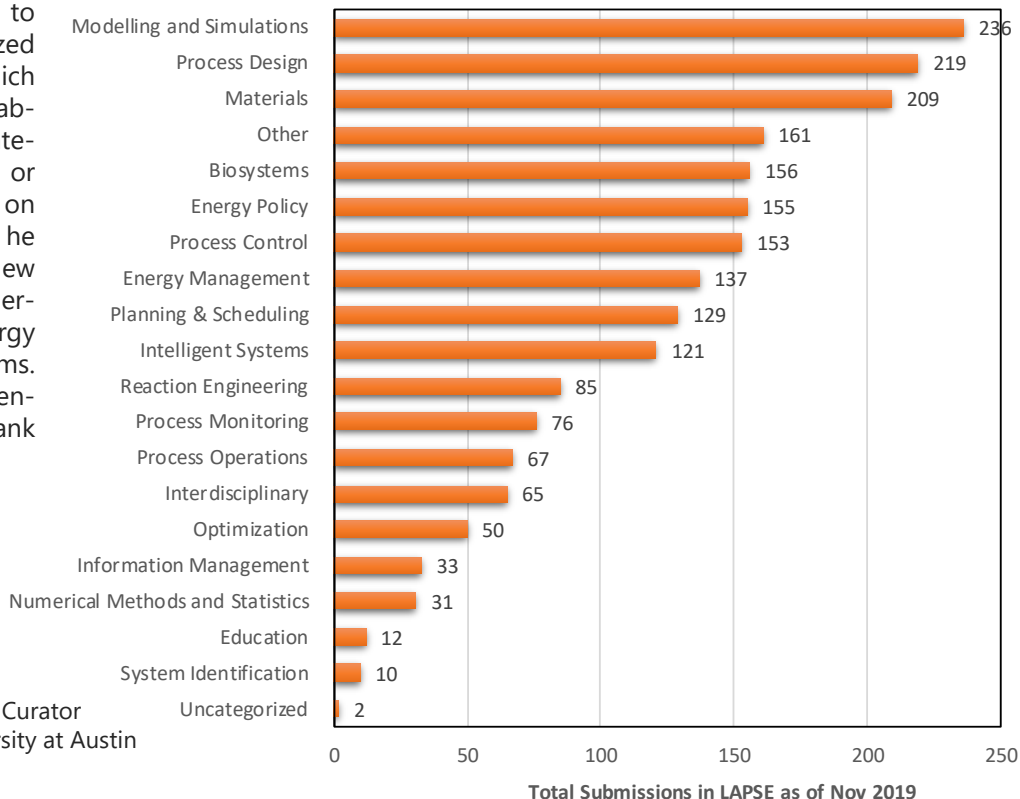**Calvin Tsay**
LAPSE Head Curator
Texas University at Austin

Funders

We continue to receive support from these organizations:

Subject Areas in LAPSE

Subject Area	Total Submissions
Modelling and Simulations	236
Process Design	219
Materials	209
Other	161
Biosystems	156
Energy Policy	155
Process Control	153
Energy Management	137
Planning & Scheduling	129
Intelligent Systems	121
Reaction Engineering	85
Process Monitoring	76
Process Operations	67
Interdisciplinary	65
Optimization	50
Information Management	33
Numerical Methods and Statistics	31
Education	12
System Identification	10
Uncategorized	2

Total Submissions in LAPSE as of Nov 2019

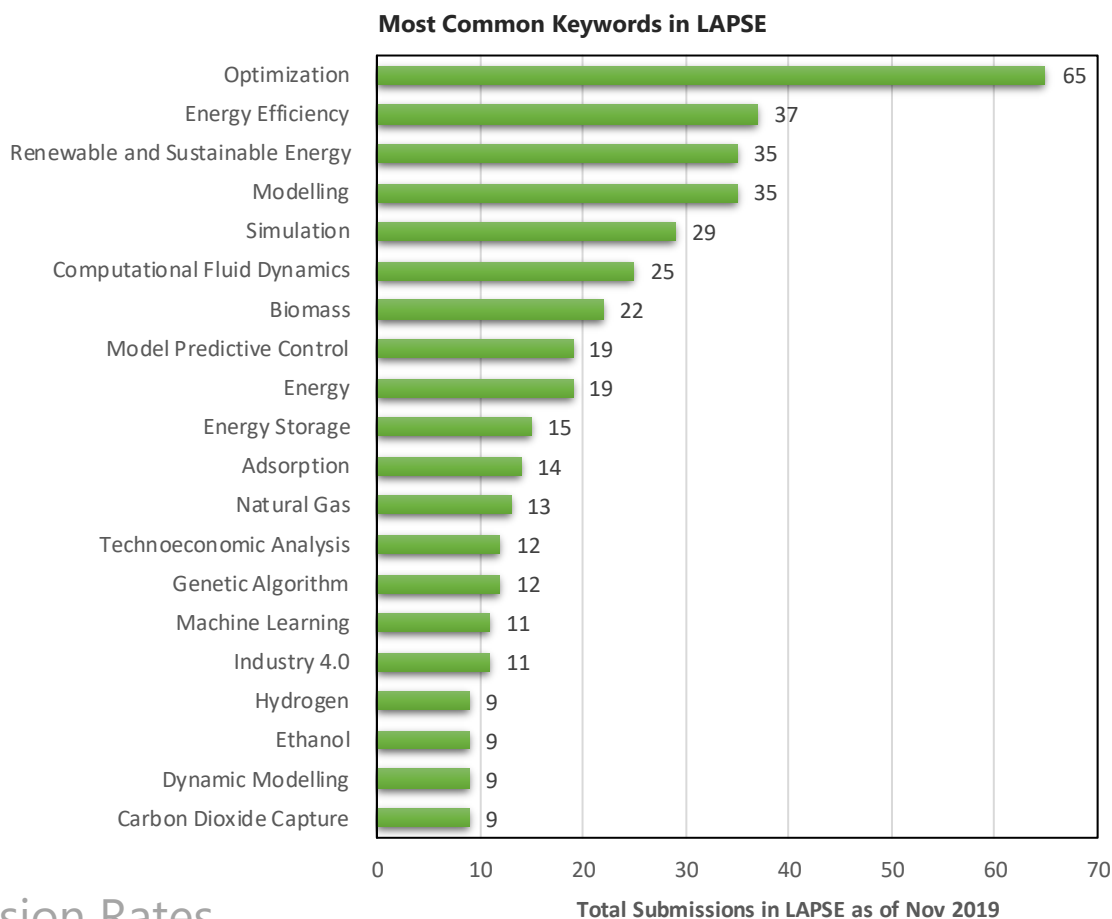the living archive for process systems engineering
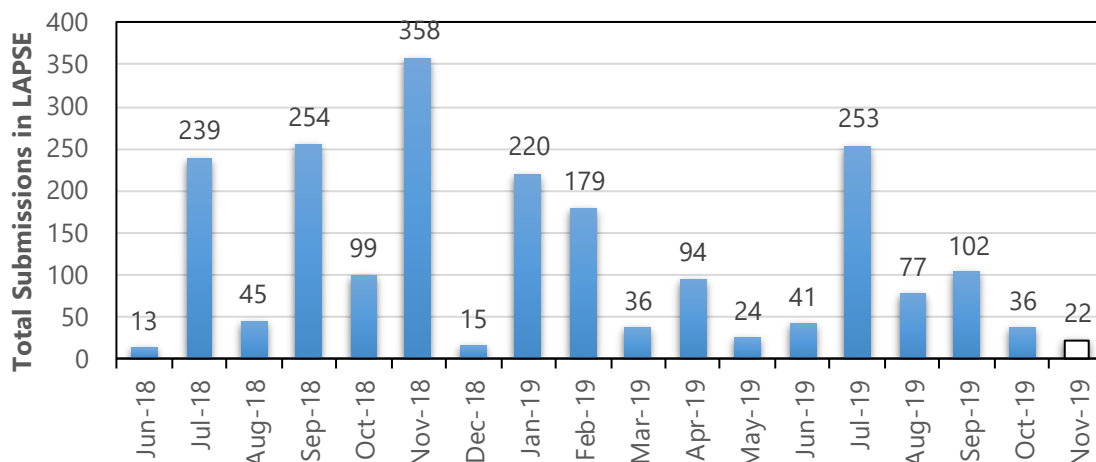
Statistics

Keywords

LAPSE allows users to enter their own searchable keywords when making submissions. The system also includes a collection of **controlled keywords** from which users can choose, to better help link related articles. LAPSE automatically suggests and identified controlled keywords from user submissions, as well as links variations in spelling and synonyms together into one controlled keyword (for example, Modelling and Modeling are matched, LNG and Liquefied Natural Gas, CO2 and Carbon Dioxide), etc. This includes submissions automatically provided by journals through keyword meta data.

The most commonly used keywords by users in LAPSE are below. Optimization remains the most common, with energy related applications, and modeling & simulation coming next.

Most Common Keywords in LAPSE

Keyword	Value
Optimization	65
Energy Efficiency	37
Renewable and Sustainable Energy	35
Modelling	35
Simulation	29
Computational Fluid Dynamics	25
Biomass	22
Model Predictive Control	19
Energy	19
Energy Storage	15
Adsorption	14
Natural Gas	13
Technoeconomic Analysis	12
Genetic Algorithm	12
Machine Learning	11
Industry 4.0	11
Hydrogen	9
Ethanol	9
Dynamic Modelling	9
Carbon Dioxide Capture	9

Total Submissions in LAPSE as of Nov 2019

Submission Rates

Submissions by month are irregular and tend to come in waves. 2018 rates were higher than 2019 rates because these included adding journal backlogs into the system, whereas 2019 submissions are for all new articles.

Total Submissions in LAPSE

Month	Total Submissions
Jun-18	13
Jul-18	239
Aug-18	45
Sep-18	254
Oct-18	99
Nov-18	358
Dec-18	15
Jan-19	220
Feb-19	179
Mar-19	36
Apr-19	94
May-19	24
Jun-19	41
Jul-19	253
Aug-19	77
Sep-19	102
Oct-19	36
Nov-19	22

Record Views

Many LAPSE submissions are widely viewed. The top 20 submissions in terms of views are shown at right. Notice that **models and presentations,** not papers, **are by far the most popular** on the site, even though they are a small percentage of contributions. This is a very interesting outcome and shows proof that LAPSE is fulfilling one of our primary motivating factors: to increase the distribution and use of chemical process models, source code, and related digital materials. Also, it shows that it **is a popular avenue for the distribution of research outcomes outside of classic research articles**. One of our top ten submissions is **a collection of course lectures** with our 11th top submission being an **educational video game**. Clearly there is a large diversity of interest in these materials from LAPSE outside of the typical preprint framework.
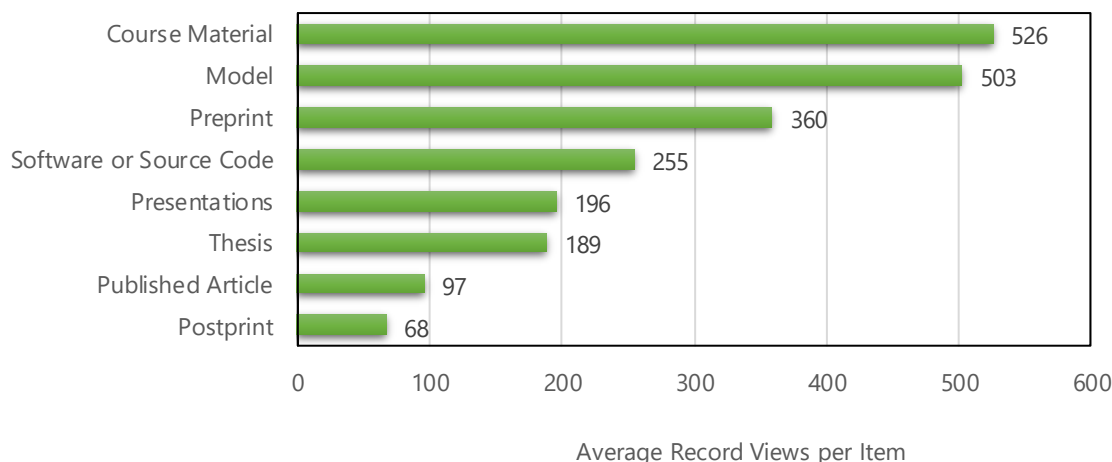
Note that Record Views include views of any version of that record (such as older versions), as well as views of the individual files contained within it when accessed separately.

The age of the article plays a role in view counts, of course. Only two of the top 20 were posted in 2019, for example.

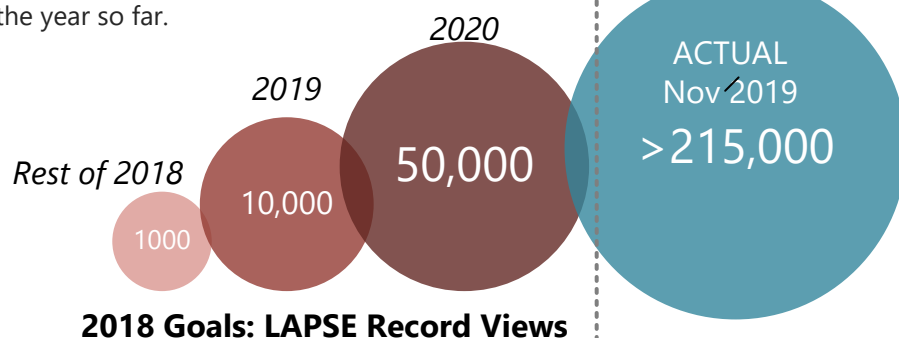## Top 20 Most Viewed Submissions to LAPSE

Model Type	LAPSE Tag	Record Views	Description
Model	2018.0126	1815	Aspen Plus Simulation
Published Article	2018.0134	1502	CO2 Capture
Preprint	2018.0443	819	Ind Eng Chem Res, Steel
Conference Presentation	2019.0620	664	FOCAPD Talk
Model	2018.0394	647	Aspen Plus Simulation
Model	2018.0444	569	CFD Simulation (I think)
Course Material	2018.1189	526	Course Lecture Slides
Presentation	2018.0806	525	Non-conference, steel refining
Presentation	2019.0442	518	Department Seminar Slides
Preprint	2018.0738	510	Comp Chem Eng, Distillation
Software or Source Code	2018.0136	493	Educational video game
Model	2018.0148	487	Aspen Plus Simulation
Conference Presentation	2018.0143	471	PSE 2018 Presentation
Preprint	2018.0133	464	Int J H2 Energy, Nuclear
Published Article	2018.0128	427	Frontiers Energy Res, Optimization
Conference Presentation	2018.0807	408	Canadian Chem Eng Conf
Preprint	2018.0144	387	J Opt Theory App, Optimization
Report	2018.0147	360	Stakeholder Report
Preprint	2018.0393	335	Can J Chem Eng, Modelling
Preprint	2018.0140	328	Applied Energy, Fuel Cells

Average Record Views Per Submission by Record Type

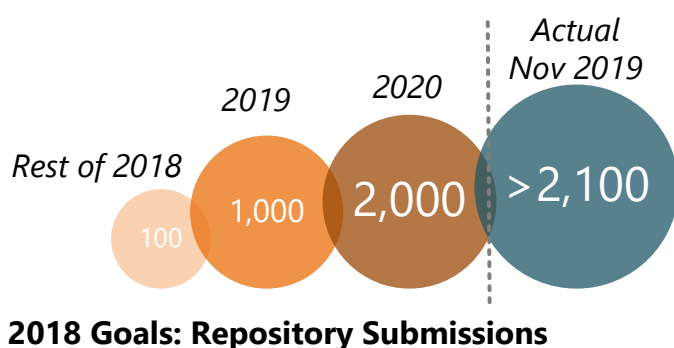| Record Type	Average Record Views
Course Material	526
Model	503
Preprint	360
Software or Source Code	255
Presentations	196
Thesis	189
Published Article	97
Postprint	68

Average Record Views per Item

Metrics for Success and Goals for Growth

The plots below were goals set in 2018, showing how we have stacked up so far. We have met or exceeded 3 of our 4 goals for the year so far.


2018 Goals: LAPSE Record Views

Rest of 2018 — 1000
2019 — 10,000
2020 — 50,000
ACTUAL Nov 2019 — >215,000

Strategy for growth:
- Continue to promote LAPSE at conferences and through journal interactions
- Linking system appears to be working to drive views between articles, continue to improve.

2018 Goals: Repository Submissions

Rest of 2018 — 100
2019 — 1,000
2020 — 2,000
Actual Nov 2019 — >2,100

Strategy for growth:
- Journal and conference partnerships encourage submissions or automatically submit.
- Society communications (listservs, mailling lists, websites, social networks).
- Outreach and use by funding partners

2018 Goals: Journal and Conference Partners

Rest of 2018 — 1
2019 — 2
2020 — 3
Actual 2019
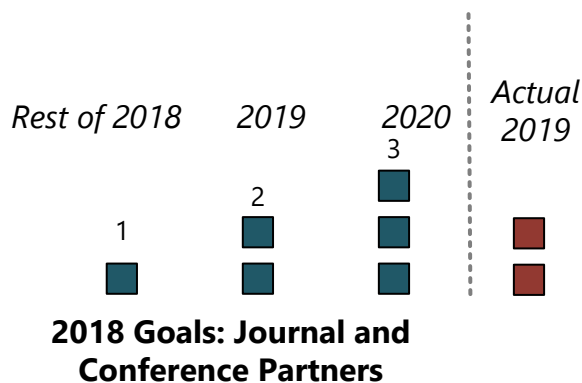
Strategy for growth:
- Network with conference organizers and journal editors
- Provide special value such as convenient forms for attendees to use, bulk-upload features.
- Use standard PubMed format for easy uploads.
- Take pro-active role in connecting with potential partners.

2018 Goals: Funding Organizations

Rest of 2018 — 5
2019 — 7
2020 — 9
Actual 2019 — 5
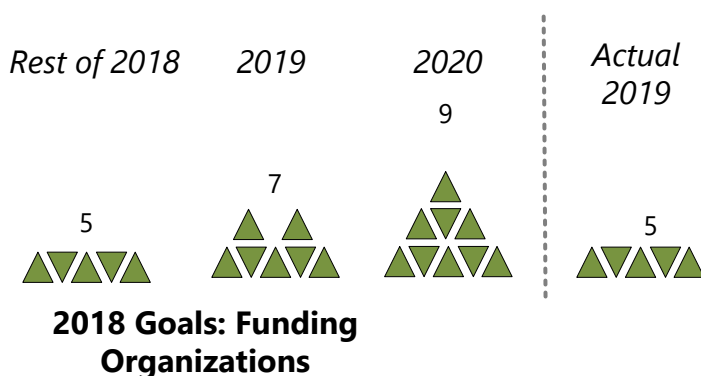
Strategy for growth:
- Outreach to additional universities and societies
- Keep costs low
- Maintain value
- Set high goals
- Provide custom functionality to funders or specific feature requests
- Continue to recruit and provide value

Security and Data Protection

Hacking Attempts

LAPSE is routinely the target of cyber attacks. We currently pay for security options with our hosting service (IONOS) that helps to mitigate this risk. For example, our protection service reported **2,677 cyber attacks on our website within the past 7 days that were blocked.**

Spam Attempts

There are many spam related attacks in addition to this. Primarily they are robot registrations (automatic creation of false accounts) which are then used to post spam on our discussion forums. We use a number of tools to block these attacks, through a combination of a third-party CAPTCHA software, Aksimet Anti-Spam, and BanHammer. Approx-imately one or two of these are still successful per week, and the spam is simply removed and the accounts removed with a subsequent IP and email ban. Over time, the tools we have been using have matured such that one or two successful attacks per week on LAPSE is actually a very small number from what it used to be. Furthermore, these only appear in the discussion forums. The database itself has so far not yet been subject to any false submissions. By comparison. syscon.mcmaster.ca has been subject to approximately 20,000 successful attacks because it does not use these tools (though on that website, users do not see it because comments are simply closed).

Human Verification

Human verification continues to be a major component of LAPSE. We presently rely on our volunteers to verify that each contribution is legitimate and appropriate. Unverified submissions are immediately available to the public in a specially marked section: only when a human curator has verified it will it show up on our front page, or within our curated subject and keyword indices. This will eventually be replaced with an earned-trust system as the number of submissions becomes too great but currently functions quite well.

Data Security and Privacy

Data Security is always a concern with web-based systems relying on user-supplied content. In addition to the anti-hacking systems in place, we use security principles in managing the website. The primary principle is *minimalism*, which is a combination of (1) designing the working systems to be as simple as possible, and (2) collecting, storing, and using as little data as possible. The simplicity aspect as a strategy can be very effective because simple systems are far easier to maintain than complex ones, meaning that updates, errors, and security risks can be resolved quickly and easily. Complex systems are more difficult to maintain, and simultaneously offer more possibilities and avenues to attack. Data minimalism means that we simply collect as little data as physically possible to run the service. For example, user profiles contain the bare minimum amount of information necessary to identify a user. No IP addresses, sensitive information, or credit card information are collected or stored. All information (except passwords, which are only stored in encrypted form and cannot be seen by any human, including the programmers) are intended for public display, and so virtually all user data remains public. With this strategy, in case of a breach, there simply does not exist any sensitive personal information to be stolen to begin with.

Future Directions

Going forward, we have some key goals for 2020.

- **Code Improvements –** We maintain a bug list and continually work to fix things as they come.
- **Search Improvements –** Our search system is simple, but needs to be made better. For privacy reasons, we chose not to use free search engines like Google that can be embedded within the site. This is because embedding a Google app in the page makes it possible for Google to track users of the website and link them to other sites across the web, creating a profile which is sold/used for advertising purposes. An in-house solution requires a significant amount of effort, however.

- **Conference Proceeding Partnerships** – At the suggestion of some conference organizers, we plan to formally launch a conference proceedings app that would compete with certain book series approaches commonly used in conferences in the field. Specifically we will be targeting future ESCAPE, FOCAPD, FOCAPO, PSE, and other conferences. The objective is to formally host all conference proceedings, and function as the publisher. This will be our primary goal for 2020, which can substantially boost visibility and participation within the PSE community.

Thank You!

Thank you for your support for LAPSE! Since our volunteers are providing their time, this allows your donations to support key infrastructure requirements such as:

- High throughput web servers
- Storage space
- Anti-virus software
- Geo-colocation
- DDOS attack management
- Redundancy
- Domain name and hosting

Contact Us

For general inquiries about LAPSE, or for how you can **become a supporting member or a volunteer**, contact:

info@psecommunity.org

To report abuse, spam, copyright violations, or other legal issues, contact:

abuse@psecommunity.org

For website useability, contact:

help@psecommunity.org

To contribute to the online discussion about LAPSE, check out our discussion forums at:

http://psecommunity.org/forums/forum/lapse

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