



# Collaborative Writing and Publishing

*April 25<sup>th</sup> 2018*

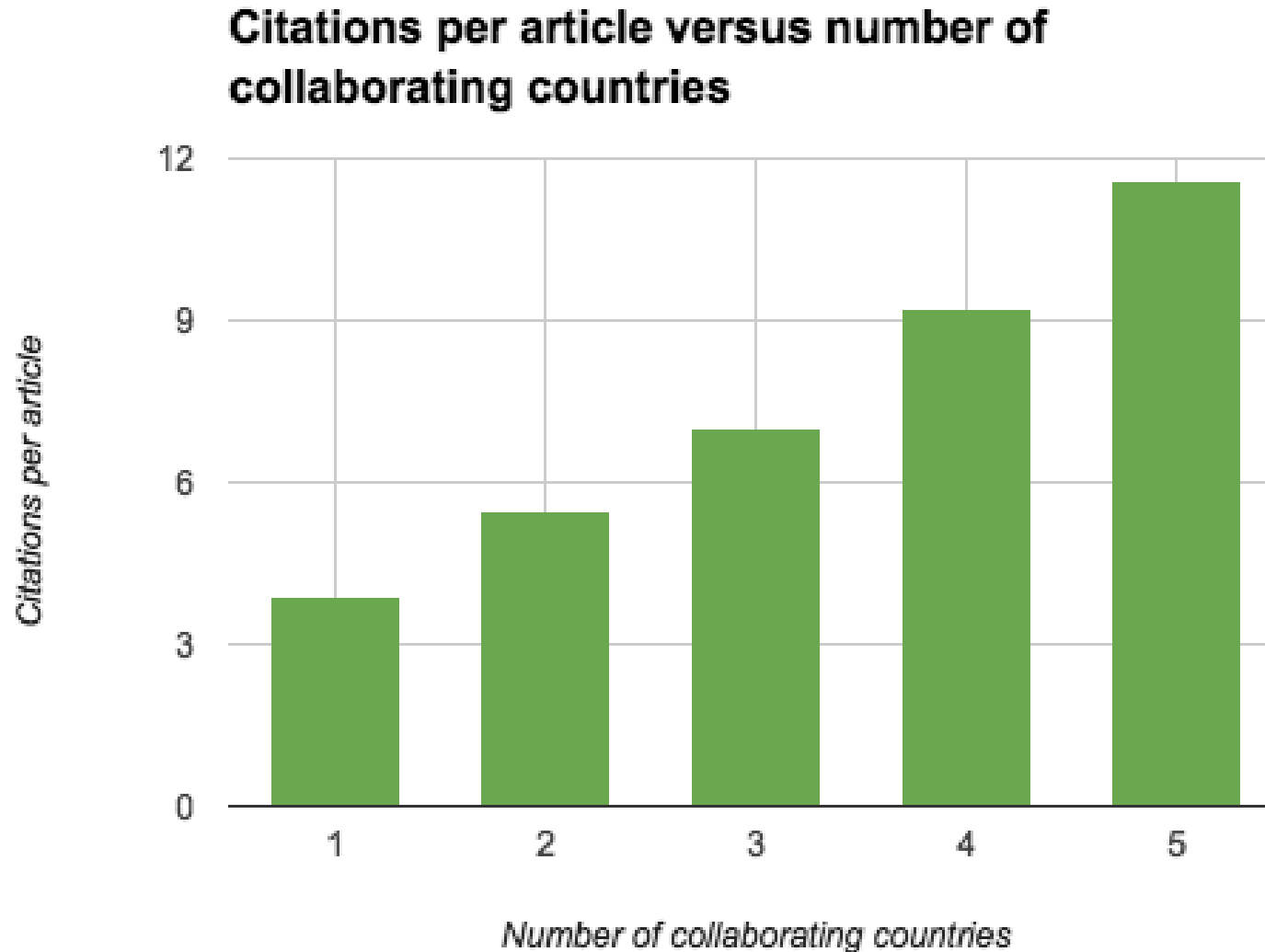
John Hammersley

Cofounder and CEO, Overleaf

[www.overleaf.com](http://www.overleaf.com)



*Global scientific collaboration is increasing,  
which helps to share research more widely*





*However, collaboration can be frustrating...*

- Multiple versions of the same document
- Long email chains
- Formatting & typesetting
- Maintaining references
- Long revision cycles



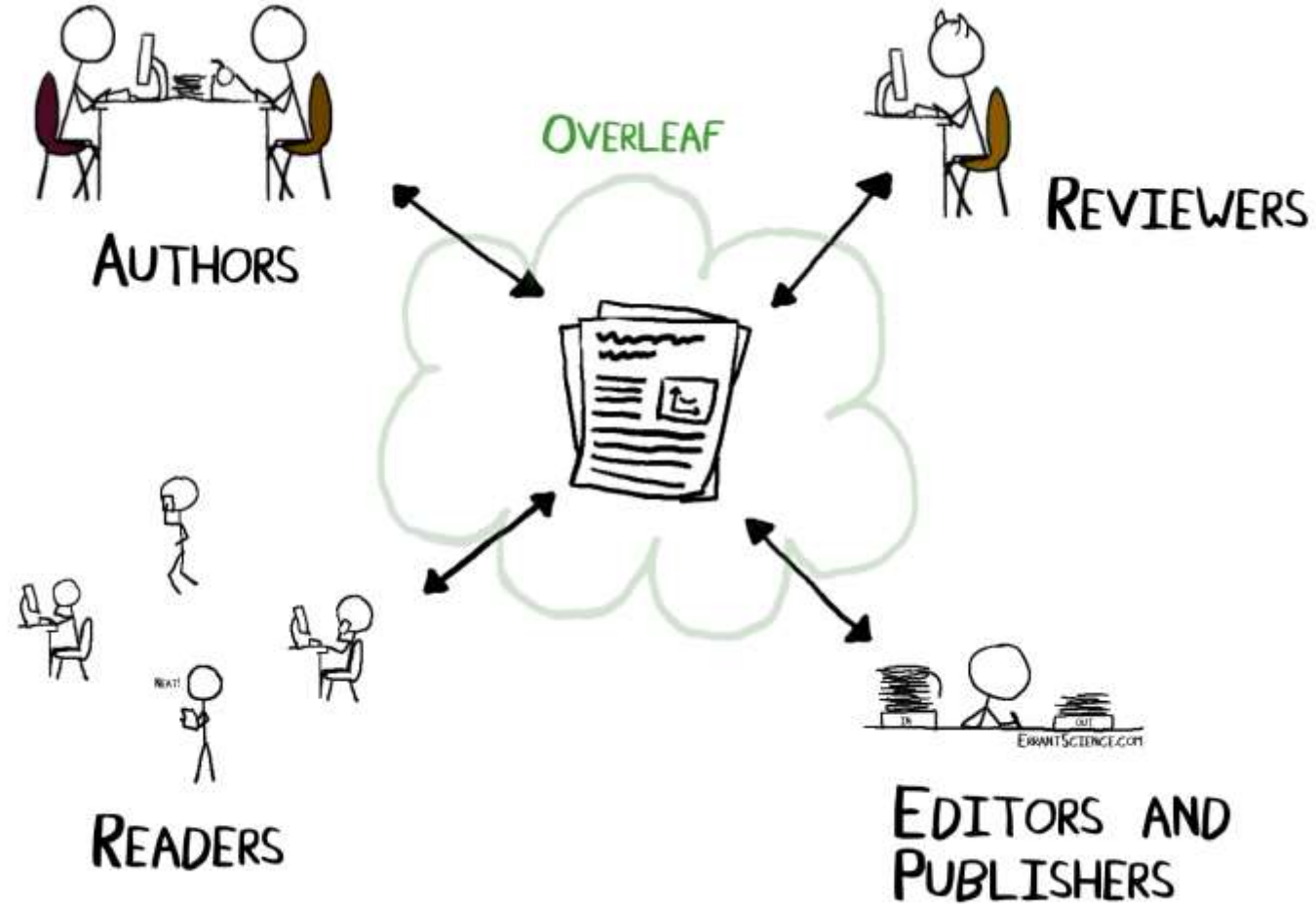


Traditional workflows create many different versions of documents which often sit in silos





Overleaf provides one master version of the document for collaboration by all





# Modeling of Trap Induced Dispersion of Large Signal Dynamic Characteristics of GaN HEMTs

O. Jardel<sup>1</sup>, S. Laurent<sup>2</sup>, T. Reveyard<sup>2</sup>, R. Quere<sup>2</sup>, P. Nakkala<sup>2</sup>, A. Martin<sup>2</sup>

S. Piotrowicz<sup>1</sup>, M. Campovecchio<sup>2</sup>, S.L. Delage<sup>1</sup>

<sup>1</sup> III-V Lab, route de Nozay, 91461 Marcoussis Cedex, France

<sup>2</sup> XLIM, 7 rue Jules Valles, 19100 Brive-la-gaillarde, France

olivier.jardel@3-5lab.fr

## Abstract

We propose here a non-linear GaN HEMT model for CAD including a trapping effects description consistent with both small-signal and large-signal operating modes. It takes into account the dynamics of the traps and then allows to accurately model the modulated large signal characteristics that are encountered in telecommunication and radar signals. This model is elaborated through low-frequency S-parameter measurements complementary to more classical pulsed-IV characterizations. A 8x75μm AlInN/GaN HEMT model was designed and particularly validated in large-signal pulsed RF operation. It is also shown that thermal and trapping effects have opposite effects on the output conductance, thus opening the way for separate characterizations of the two effects.

## Introduction

Gallium Nitride (GaN) High Electron Mobility Transistors (HEMT) on SiC are now recognized as good candidates for the development of a number of RF applications and notably Power Amplifiers (PA) for telecommunications and radars, due to their high breakdown voltage, their high cut-off frequency as well as their high temperature capabilities. However they are still subject to parasitics effects such as thermal effects and especially trapping effects. One convenient way to identify the impact of trapping effects is to monitor the average drain current of the transistor versus an increasing RF input power. Those trapping effects have been extensively studied using a number of techniques such as pulsed measurements, load-pull measurements as well as frequency dispersion measurements. At the same time, models have been proposed that take those effects into account [1], [2], [3], and while the effects of traps are well taken into account in CW conditions, their impacts on

# Modeling of Trap Induced Dispersion of Large Signal Dynamic Characteristics of GaN HEMTs

O. Jardel<sup>\*</sup>, S. Laurent<sup>†</sup>, T. Reveyard<sup>†</sup>, R. Quéré<sup>†</sup>, P. Nakkala<sup>†</sup>, A. Martin<sup>†</sup>

S. Piotrowicz<sup>\*</sup>, M. Campovecchio<sup>†</sup>, S.L. Delage<sup>\*</sup>

<sup>\*</sup> III-V Lab, route de Nozay, 91461 Marcoussis Cedex, France

<sup>†</sup> XLIM, 7 rue Jules Valles, 19100 Brive-la-gaillarde, France  
olivier.jardel@3-5lab.fr

**Abstract**—We propose here a non-linear GaN HEMT model for CAD including a trapping effects description consistent with both small-signal and large-signal operating modes. It takes into account the dynamics of the traps and then allows to accurately model the modulated large signal characteristics that are encountered in telecommunication and radar signals. This model is elaborated through low-frequency S-parameter measurements complementary to more classical pulsed-IV characterizations. A 8x75μm AlInN/GaN HEMT model was designed and particularly validated in large-signal pulsed RF operation. It is also shown that thermal and trapping effects have opposite effects on the output conductance, thus opening the way for separate characterizations of the two effects.

## I. INTRODUCTION

Gallium Nitride (GaN) High Electron Mobility Transistors (HEMT) on SiC are now recognized as good candidates for the development of a number of RF applications and notably Power Amplifiers (PA) for telecommunications and radars, due to their high breakdown voltage, their high cut-off frequency as well as their high temperature capabilities. However they are still subject to parasitics effects such as thermal effects and especially trapping effects. One convenient way to identify the impact of trapping effects is to monitor the average drain current of the transistor versus an increasing RF input power. Those trapping effects have been extensively studied using a number of techniques such as pulsed measurements, load-pull measurements as well as frequency dispersion measurements. At the same time, models have been proposed that take those effects into account [1], [2], [3], and while the effects of traps are well taken into account in CW conditions, their impacts on dynamic large signal characteristics remain difficult to understand. They manifest themselves under modulated signals such as RF pulses or telecommunications signals. In this paper we propose to investigate the dynamics of those trapping effects using large signal pulsed load pull measurements as well as low frequency dispersion measurements. It will be shown that a consistent nonlinear model can be obtained that allows to describe the full dynamic behavior of GaN transistors. The paper is organized as follows: Section II describes the theoretical impact of traps on the average current obtained under pulsed load pull conditions. Section III presents the measurements performed on an AlInN/GaN 8x75μm HEMT and the results

## II. THE IMPACT OF TRAPS ON SIGNAL CHARACTERISTICS

One convenient way to identify the impact of trapping effects is to monitor the average drain current of the transistor versus an increasing RF input power. It has already been reported in [1] and [3] that this drain current under class-AB conditions decreases as the input power increases, contradicting the expected characteristics. Clearly this behavior cannot be explained by thermal behavior as far as the channel temperature sinks when the power increases and would leads, at least for moderate powers, to an average drain current enlargement.

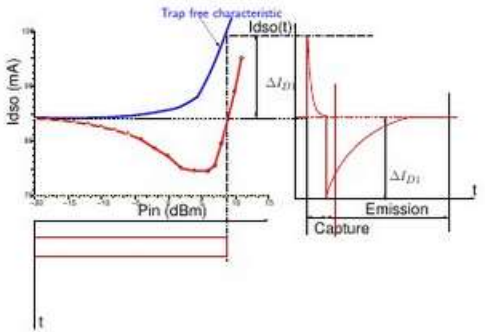


Figure 1. Representation of the mechanism induced by traps on the average drain current.

Pulsed RF measurements were performed under DC bias on AlGaN/GaN and InAlN/GaN HEMTs of 8x75x0.25μm<sup>2</sup> for a large number of output loads. For all devices, we obtain the same shape of the average drain current which is schematized in Figure 1. The average current decrease is due to the trap capture, which increases alike to the gate and drain voltage excursions versus the input power for a CW measurement. Indeed, the number of ionized traps is roughly proportional to the maximum value of the drain-source voltage, because of the dissymmetry of the capture and emission time constants [4]. When the RF power is pulsed, the average drain current



Free to use, Overleaf has over  
2 million users worldwide





Supported by local champions - enthusiastic individuals who help grow the community and improve scholarly writing and communication:

<https://www.overleaf.com/advisors>



Dmitry Korotin

Institute of Metal Physics



Danil Fedorovych

Higher School of Economics



Vitaly Bragilevsky

Southern Federal University



e.g. Danil uses Overleaf LaTeX templates in his Introduction to LaTeX course

**Документы и презентации в LaTeX (Introduction to LaTeX)**

About this course: LaTeX (читается «латекс») — научная нотация для документов. На этом курсе вы узнаете, как оформить свои идеи в виде красивого, профессионально сверстанным текста или слайдов презентации.

Created by: National Research University Higher School of Economics

Taught by: Danil Fedorovych, Senior Lecturer, Department of Theoretical Economics

Commitment	5 недель, от 4 до 6 часов в неделю
Language	Russian
How To Pass	Pass all graded assignments to complete the course.
User Ratings	★★★★★ Average User Rating: 4.8 <a href="#">See what learners said</a>

**5.2.1. Русский язык в LaTeX**

Author: Danil Fedorovych  
License: Other (as stated in the work) (1)

[OPEN AS TEMPLATE](#) [VIEW PDF](#)

View Source Download PDF

**Abstract:** Этот шаблон документа разработан в 2014 году Даниилом Федоровым (danil@fedorovych.ru) для использования в курсе «Документы и презентации в LaTeX», записанном НИУ ВШЭ для Coursera.org: <http://coursera.org/course/latex>. Исходная версия шаблона — <https://www.latexlive.com/coursera/latex/5.2.1>

[Find More Templates](#)

5.2.1. Русский язык в LaTeX

Илья Федорович

5 июля 2014 г.

Аннотация

Этот шаблон...

Стандартный шаблон... (латекс)

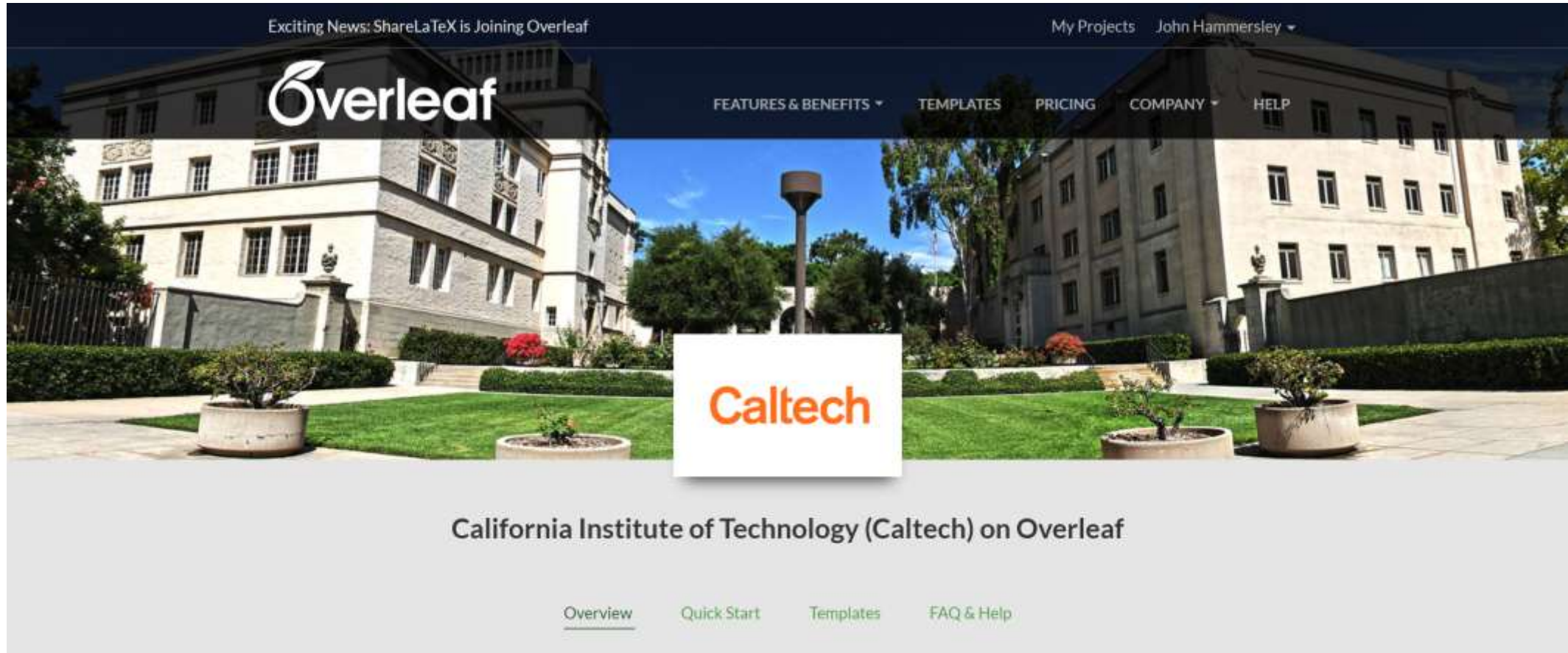
Наша цель для шаблона...

Этот шаблон...

- 1. Введение**  
Наша цель...
- 2. Проблемы**  
В русском языке...



Adopted by a growing number of universities and institutions around the world, including Stanford, Caltech and CERN



The screenshot shows the Overleaf website interface. At the top, there is a dark navigation bar with the Overleaf logo on the left and links for 'My Projects' and 'John Hammersley' on the right. Below the navigation bar is a large banner image of a Caltech building. Overlaid on the bottom center of the banner is a white box with the 'Caltech' logo in orange. Below the banner, the text 'California Institute of Technology (Caltech) on Overleaf' is displayed. At the bottom of the banner area, there are four links: 'Overview', 'Quick Start', 'Templates', and 'FAQ & Help', with 'Overview' being the active link.

Exciting News: ShareLaTeX is Joining Overleaf

My Projects John Hammersley

Overleaf

FEATURES & BENEFITS ▾ TEMPLATES PRICING COMPANY ▾ HELP

Caltech

California Institute of Technology (Caltech) on Overleaf

Overview Quick Start Templates FAQ & Help

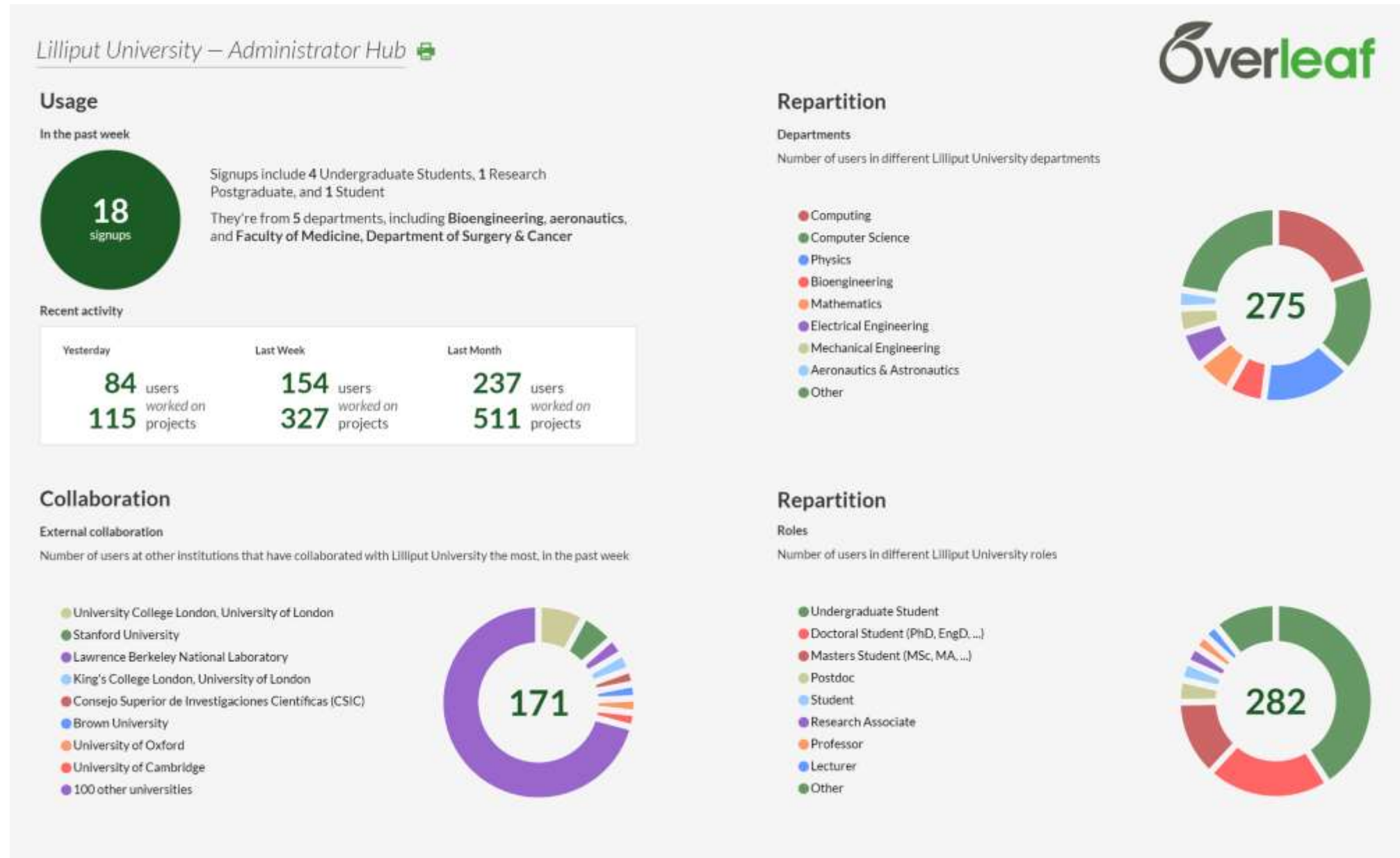
## Overview

Caltech Library is providing free Overleaf Pro+ accounts for all students, faculty and staff who would like to use a collaborative, online LaTeX editor for their projects.

Overleaf is designed to make the process of writing, editing and producing your research papers and project reports much quicker for both you and your collaborators. Overleaf can also be [linked to other services](#) such as Mendeley Cit and Plot.ly



# Overleaf provides real-time data on uptake, usage & collaborations





# University administrators can also opt to receive a monthly digest email with key statistics

## Metrics report for Lilliput University on Overleaf



welcome@overleaf.com

to me

01/07/2017



Dear John Hammersley,

Here's your monthly summary of **Lilliput University** usage on Overleaf.

October saw **415** users signing up. Signups include **65** Doctoral Students (PhD, EngD, ...), **58** Masters Students (MSc, MA, ...), and **35** Undergraduate Students. They're from **45** departments, including **Computer Science**, **Electrical Engineering**, and **Mechanical Engineering**.

**1.38 Thousand** users made **2.27 Million** edits on **4.97 Thousand** projects.

**4** versions were published.

Projects worked on by your team have **1.32** collaborators on average.

You can view the [team hub](#) for an overview, or the [metrics dashboard](#) for more details.

---

Don't want to receive these emails? [edit your email preferences](#).



# Example: Overleaf at Stanford University

- **450% increase in usage** in the first year the institutional solution was adopted
- Now used by over **7,000 students, researchers, staff and faculty**

*“**Overleaf** has been a huge success at Stanford.*

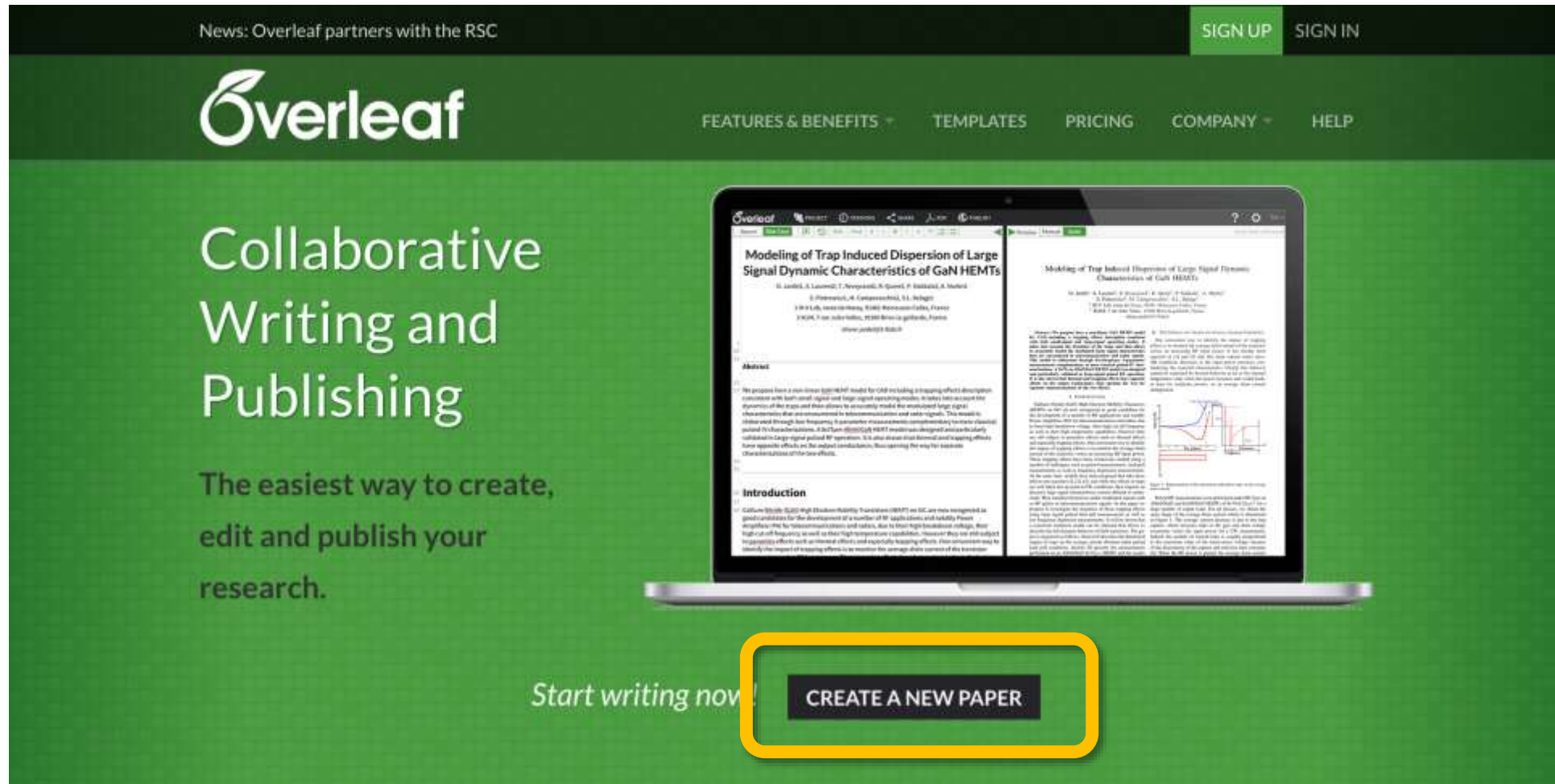
*We provide Overleaf Pro accounts to all students, faculty and staff and the **uptake and feedback** has been **tremendous!**”*



Helen Josephine  
Head of the Terman  
Engineering Library, Stanford



# How does it work? Start writing with one click, or choose from 3,000+ templates



The image shows the Overleaf website homepage. At the top, there is a dark green header with the text "News: Overleaf partners with the RSC" on the left, and "SIGN UP" and "SIGN IN" buttons on the right. Below the header is a green banner with the Overleaf logo on the left and navigation links "FEATURES & BENEFITS", "TEMPLATES", "PRICING", "COMPANY", and "HELP" on the right. The main content area has a green background. On the left, the text "Collaborative Writing and Publishing" is written in large white letters, followed by "The easiest way to create, edit and publish your research." in smaller white text. In the center, there is a laptop displaying a document titled "Modeling of Trap Induced Dispersion of Large Signal Dynamic Characteristics of GaN HEMTs". Below the laptop, the text "Start writing now" is written in white, and a yellow-outlined button with the text "CREATE A NEW PAPER" is positioned to the right.

Overleaf can also be installed on a local network



# Templates linked directly from publisher/journal websites

Proceedings of the National Academy of Sciences of the United States of America

PNAS

CURRENT ISSUE // ARCHIVE // NEWS & MULTIMEDIA // AUTHORS // ABOUT // COLLECTED ARTICLES // BROWSE BY TOPIC // EARLY EDITION // FRONT MATTER

FOR AUTHORS

Information for Authors

**How to Submit Your Manuscript and Figures**

Submit an Article

Author Frequently Asked Questions

Preparation of Revised Submissions

For Reviewers

## Submitting LaTeX Files

PNAS is excited to announce our latest [LaTeX template](#) is available on [Overleaf](#). Overleaf allows authors to easily create their submissions using a PNAS-formatted LaTeX template. Authors will have the option to download a PDF (best for initial submissions) or a .zip file that can be uploaded into the PNAS submission system.


If you experience any issues when creating your manuscript, support is provided by Overleaf at the contact information below, or you can contact the [PNAS office](#) for assistance.

We are pleased to provide this new service to authors and encourage our LaTeX users to try it out.

**Overleaf:**

Email: [support@overleaf.com](mailto:support@overleaf.com)  
[Overleaf Support Contact Form](#)

[05/16]

 Current Issue  
Email Alerts  
Subscribe  
RSS

**Don't Miss**

Thinking of submitting your next paper to PNAS? Learn tips in our [PNAS tutorial videos](#).

**Other PNAS Media**

- [Image Gallery](#)
- [Video Library](#)
- [Follow Us on Twitter](#)
- [Find Us on Facebook](#)

▼ MOST READ MOST CITED



Edit on the left, see the typeset version on the right

**Overleaf** PROJECT HISTORY SHARE PDF SUBMIT TO GENETICS

Add Files... Word Count

files

styles

GSA-journal-template.tex

example-bibliography.bib

example-figure.png

genetics.bst

gsajnl.cls

DOWNLOAD AS ZIP

Save to Dropbox

Source Rich Text Edit Find More

Preview Manual Auto up-to-date and saved

## Your Abstract

In addition to the guidelines provided in the example abstract above, your abstract should:

- provide a synopsis of the entire article;
- begin with the broad context of the study, followed by specific background for the study;
- describe the purpose, methods and procedures, core findings and results, and conclusions of the study;
- emphasize new or important aspects of the research;
- engage the broad readership of GENETICS and be understandable to a diverse audience (avoid using jargon);
- be a single paragraph of less than 250 words;
- contain the full name of the organism studied;
- NOT contain citations or abbreviations.

## Introduction

For the introduction, authors should be mindful of the broad readership of the journal. The introduction should set the stage for the importance of the work to a generalist reader and draw the reader in to the specific study. The scope and impact of the work should be clearly stated.

In individual organisms where a mutant is being studied, the

## Template for preparing your submission to GENETICS using Overleaf

Author One<sup>1,†</sup>, Author Two<sup>1</sup>, Author Three<sup>1</sup>, Author Four<sup>2</sup> and Author Five<sup>1,‡</sup>  
<sup>†</sup>Author one affiliation, <sup>‡</sup>Author two affiliation, <sup>1</sup>Author three affiliation, <sup>2</sup>Author four affiliation, <sup>1,†</sup> Author five affiliation

**ABSTRACT** The abstract should be written for people who may not read the entire paper, so it must stand on its own. The impression it makes usually determines whether the reader will go on to read the article, so the abstract must be engaging, clear, and concise. In addition, the abstract may be the only part of the article that is indexed in databases, so it must accurately reflect the content of the article. A well-written abstract is the most effective way to reach intended readers, leading to more robust search, retrieval, and usage of the article. Please see additional guidelines notes on preparing your abstract below.

**KEYWORDS** Keyword; Keyword2; Keyword3; ...

This Genetics journal template is provided to help you write your work in the correct journal format. Instructions for use are provided below.

**Guide to using this template in Overleaf**

This template is provided to help you prepare your article for submission to the Genetics.

**Author Affiliations**

For the authors' names, indicate different affiliations with the symbols: <sup>1</sup>, <sup>†</sup>, <sup>‡</sup>, <sup>§</sup>. After four authors, the symbols double, triple, quadruple, and so forth as required.

**Your Abstract**

In addition to the guidelines provided in the example abstract above, your abstract should:

- provide a synopsis of the entire article;
- begin with the broad context of the study, followed by specific background for the study;
- describe the purpose, methods and procedures, core findings and results, and conclusions of the study;
- emphasize new or important aspects of the research;

Copyright: © 2016 by the Genetics Society of America  
doi: 10.1534/genetics.100.000000  
Manuscript compiled: Monday 28<sup>th</sup> July 2016  
<sup>†</sup>Please insert the affiliation correspondence address and email for the corresponding author. The corresponding author should be marked with a <sup>†</sup> in the author list, as shown in the example.

- engage the broad readership of GENETICS and be understandable to a diverse audience (avoid using jargon);
- be a single paragraph of less than 250 words;
- contain the full name of the organism studied;
- NOT contain citations or abbreviations.

### Introduction

For the introduction, authors should be mindful of the broad readership of the journal. The introduction should set the stage for the importance of the work to a generalist reader and draw the reader in to the specific study. The scope and impact of the work should be clearly stated.

In individual organisms where a mutant is being studied, the rationale for the study of that mutant must be clear to a geneticist not studying that particular organism. Similarly, study of particular phenotypes should be justified broadly and not on the basis of interest for that organism alone. General background on the importance of the genetic pathway and/or phenotype should be provided in a single, well-reasoned paragraph near the beginning of the introduction.

Authors are encouraged to:

- cite the supporting literature completely rather than select a subset of citations;
- provide important background citations, including relevant review papers (to help orient the non-specialist reader);
- cite similar work in other organisms.

Genetics, Vol. XXX, XXXX, XXXX July 2016 1



# Edit underlying LaTeX source, if you like

The screenshot displays the Overleaf web editor interface. On the left, a file explorer shows a project named 'PROJECT' containing a 'files' folder, a 'styles' folder, and a 'GSA-journal-template.tex' file. Below the file explorer, there are buttons for 'DOWNLOAD AS ZIP' and 'Save to Dropbox'. The main editor area is split into two panes. The left pane shows the LaTeX source code for the 'GSA-journal-template.tex' file, with line numbers 1 through 32. The code includes document class settings, journal-specific macros for 'GENETICS', author and affiliation definitions, keywords, a running title, and a corresponding author field. The right pane shows the preview of the document, which is a template for preparing a submission to 'GENETICS' using Overleaf. The preview includes a title, author list, abstract, keywords, and sections for 'Guide to using this template in Overleaf', 'Author Affiliations', 'Your Abstract', and 'Introduction'. The preview also includes a list of guidelines for the abstract and introduction, and a list of citation rules.

**Overleaf** PROJECT HISTORY SHARE PDF SUBMIT TO GENETICS ? ? ? GENETICS

Add Files... Word Count

files

styles

GSA-journal-template.tex

example-bibliography.bib

example-figure.png

genetics.bst

gsajnl.cls

DOWNLOAD AS ZIP

Save to Dropbox

Source Rich Text Edit Find More

Preview Manual Auto up-to-date and saved

GENETICS | INVESTIGATION

## Template for preparing your submission to *GENETICS* using Overleaf

Author One<sup>1,2</sup>, Author Two<sup>3</sup>, Author Three<sup>4</sup>, Author Four<sup>5</sup> and Author Five<sup>6</sup>  
<sup>1</sup>Author one affiliation, <sup>2</sup>Author two affiliation, <sup>3</sup>Author three affiliation, <sup>4</sup>Author four affiliation, <sup>5</sup>Author five affiliation

### ABSTRACT

The abstract should be written for people who may not read the entire paper, so it must stand on its own. The impression it makes usually determines whether the reader will go on to read the article, so the abstract must be engaging, clear, and concise. In addition, the abstract may be the only part of the article that is indexed in databases, so it must accurately reflect the content of the article. A well-written abstract is the most effective way to reach intended readers, leading to more robust search, retrieval, and usage of the article. Please see additional guidelines notes on preparing your abstract below.

**KEYWORDS** Keyword; Keyword2; Keyword3; ...

**Guide to using this template in Overleaf**  
This template is provided to help you prepare your article for submission to the *Genetics* journal.

**Author Affiliations**  
For the authors' names, indicate different affiliations with the symbols \*, †, ‡, §. After four authors, the symbols double, triple, quadruple, and so forth as required.

**Your Abstract**  
In addition to the guidelines provided in the example abstract above, your abstract should:

- provide a synopsis of the entire article;
- begin with the broad context of the study, followed by specific background for the study;
- describe the purpose, methods and procedures, core findings and results, and conclusions of the study;
- emphasize new or important aspects of the research;

**Introduction**  
For the introduction, authors should be mindful of the broad readership of the journal. The introduction should set the stage for the importance of the work to a generalist reader and draw the reader in to the specific study. The scope and impact of the work should be clearly stated.

In individual organisms where a mutant is being studied, the rationale for the study of that mutant must be clear to a geneticist not studying that particular organism. Similarly, study of particular phenotypes should be justified broadly and not on the basis of interest for that organism alone. General background on the importance of the genetic pathway and/or phenotype should be provided in a single, well-reasoned paragraph near the beginning of the introduction.

Authors are encouraged to:

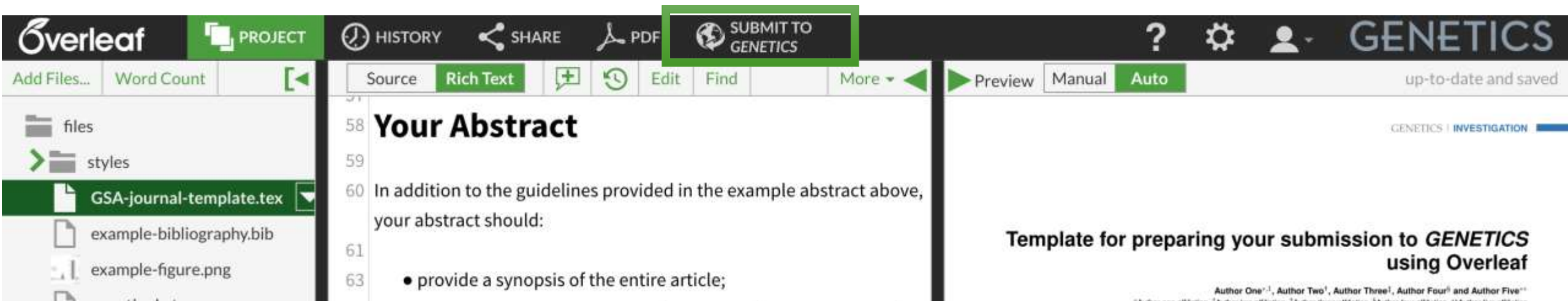
- cite the supporting literature completely rather than select a subset of citations;
- provide important background citations, including relevant review papers (to help orient the non-specialist reader);
- cite similar work in other organisms.

Copyright © 2014 by the Genetics Society of America  
doi: 10.1534/genetics.1203.300033  
Manuscript compiled: Monday 27<sup>th</sup> July 2014  
\*Please insert the affiliation correspondence address and email for the corresponding author. The corresponding author should be marked with a \* in the author list, as shown in the example.

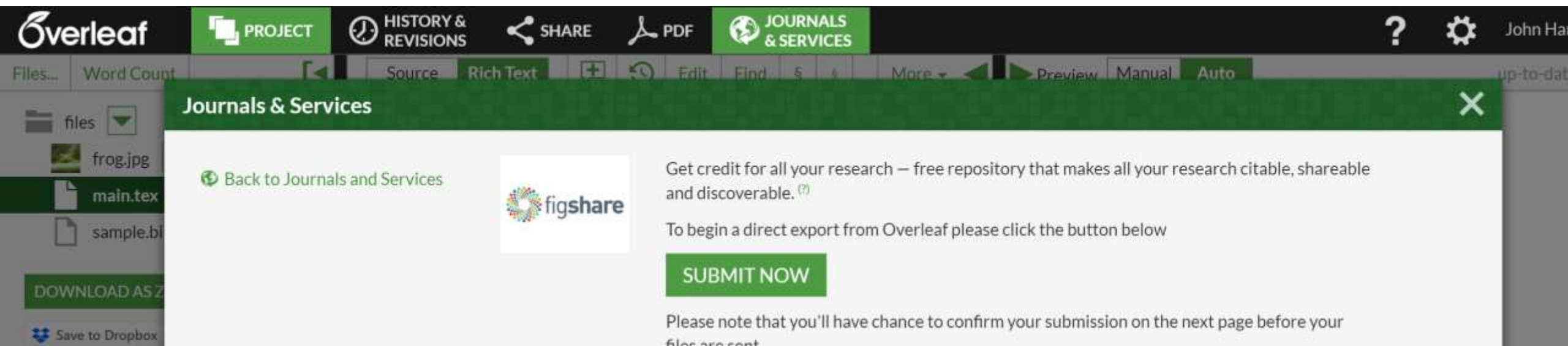
Genetics, Vol. XXX, XXXX-XXXX July 2014 1



# Submit directly from Overleaf to journals



and to pre-print servers and repositories such as figshare





 **IEEE** **SPRINGER** **NATURE** **COS** **SPIE.**

**PeerJ**

**OXFORD**  
UNIVERSITY PRESS

**G A**  
Genetics Society of America

 **ASBMB**

 **AGU**  
American Geophysical Union

**OSA**  
The Optical Society

**ASCE**

**PNAS**

**F1000**  
Research

**bioRxiv**  
THE PREPRINT SERVER FOR BIOLOGY

 **figshare**  
credit for all your research

 **MENDELEY**

**ed/tage**  
by CACTUS

 **Rubriq** **zotero**

 **AJE**

**IOS**  
REVIEW

 **bioedit**

 **enago**

 **em**

**SCHOLARONE**<sup>TM</sup>

 **eJournalPress**

 **IEEE**  
**Collabratec**



For a smooth workflow, files and metadata are passed in the background

The screenshot shows a web browser window with the URL <https://f1000research.com/author/submit/new/external?>. The page is titled "Submit Your Manuscript" and features a green notification box at the top right stating "Your Overleaf file is being uploaded". The form is divided into sections: "About the Article", "Article Type", "Article Title", and "Authors".

**About the Article**

**Article Type \***

<input type="radio"/> Research Article	<input type="radio"/> Opinion Article	<input type="radio"/> Case Report
<input type="radio"/> Review	<input type="radio"/> Software Tool Article	<input type="radio"/> Correspondence
<input type="radio"/> Systematic Review	<input type="radio"/> Observation Article	<input type="radio"/> F1000 Faculty Critique
<input type="radio"/> Method Article	<input type="radio"/> Research Note	<input type="radio"/> Editorial
<input type="radio"/> Study Protocol	<input type="radio"/> Antibody Validation Article	<input type="checkbox"/> F1000 Faculty Review
<input type="radio"/> Clinical Practice Article	<input type="radio"/> Data Note	

**Article Title \***

F1000Research Submission Demo

**Authors**

John Lees-Miller (jdleesmiller@gmail.com) ☐ Corresponding Author



*“Prior to the integration with Overleaf, F1000Research could not easily accept LaTeX submissions.*

*Now, approximately 10-15% of all submissions come in via the Overleaf template and submission link.*



Case study: [www.overleaf.com/blog/344](http://www.overleaf.com/blog/344)







Alex Buerkle

@disequillbber



Following

3rd large NSF proposal of 2016 subm today with big teams of co-authors using [@overleaf](#). One already rec for funding. LTER,EPSCoR sent today

RETWEETS

3

LIKES

12



1:43 PM - 2 Aug 2016



3



12



Aaron MacNeil

@ma\_macneil



Following

Just submitted to [@thePeerJ](#) using [@overleaf](#) using 3 clicks. [#awesomeness](#)

RETWEETS

3

LIKES

5



1:21 PM - 12 May 2016



3



5



SHAREPDFSUBMIT TO F1000RESEARCH

MorePreviewManualAuto

quence

aph-based  
ver, the  
n from the

the basic  
anipulation.  
a structures

-based

age, a  
-efficient  
read data

es,

ch

op of Bloom  
sion

for users:

res and  
ain kinds of  
develop

ted in C++,

Python  
form various  
veloned on

F1000Research

F1000Research 2014 - DRAFT ARTICLE (PRE-SUBMISSION)

### The khmer software package: enabling efficient nucleotide sequence analysis

Michael R. Crusoe<sup>1</sup>, Hussien Alameldin<sup>2</sup>, Sherine Awad<sup>3</sup>, Ryan R. Boyce<sup>4</sup>, Elmar Bucher<sup>5</sup>, Adam Caldwell<sup>6</sup>, Reed Cartwright<sup>7</sup>, Bede Constantinides<sup>8</sup>, Greg Edverson<sup>9</sup>, Scott Fay<sup>10</sup>, Jake Fenton<sup>11</sup>, Thomas Fenzl<sup>12</sup>, Jordan Fish<sup>13</sup>, Leonor Garcia-Gutierrez<sup>14</sup>, Phillip Garland<sup>15</sup>, Jonathan Gluck<sup>16</sup>, Ivan Gonzalez<sup>17</sup>, Sarah Guermond<sup>18</sup>, Jiarong Guo<sup>19</sup>, Aditi Gupta<sup>20</sup>, Josh Herr<sup>21</sup>, Adina Howe<sup>22</sup>, Alex Hyer<sup>23</sup>, Andreas Härpfer<sup>24</sup>, Luiz Irber<sup>25</sup>, Rhys Kidd<sup>26</sup>, Heather L. Wiencko<sup>27</sup>, David Lin<sup>28</sup>, Justin Lippi<sup>29</sup>, Tamer Mansour<sup>30</sup>, Pamela McAulty<sup>31</sup>, Eric McDonald<sup>32</sup>, Jessica Mizzi<sup>33</sup>, Kevin Murray<sup>34</sup>, Joshua Nahum<sup>35</sup>, Kaben Nanlohy<sup>36</sup>, Lex Nederbragt<sup>37</sup>, Humberto Ortiz-Zuazaga<sup>38</sup>, Jeramia Ory<sup>39</sup>, Jason Pell<sup>40</sup>, Chuck Pepe-Ranne<sup>41</sup>, Rodney Picett<sup>42</sup>, Zachary N. Russ<sup>43</sup>, Erich Schwarz<sup>44</sup>, Camille Scott<sup>45</sup>, Josiah Seaman<sup>46</sup>, Scott Sievert<sup>47</sup>, Jared Simpson<sup>48</sup>, Connor T. Skennerton<sup>49</sup>, James Spencer<sup>50</sup>, Ramakrishnan Rajaram Srinivasan<sup>51</sup>, Daniel Standage<sup>52</sup>, James Stapleton<sup>53</sup>, Susan Steinman<sup>54</sup>, Joe Stein<sup>55</sup>, Benjamin Taylor<sup>56</sup>, Will Trimble<sup>57</sup>, Michael Wright<sup>58</sup>, Brian Wyss<sup>59</sup>, Qingpeng Zhang<sup>60</sup>, enzyme<sup>61</sup>, and C. Titus Brown<sup>62</sup>

<sup>1</sup>mcrusoe@msu.edu, Microbiology and Molecular Genetics, Michigan State University, East Lansing, MI 48824, USA



Michael R. Crusoe

@biocrusoe



Follow

We have 62 co-authors on the khmer project paper! Great free LaTeX tech support from [@F1000Research](#) & [@overleaf](#); +100



# THANK YOU & CONTACT US

[www.digital-science.com](http://www.digital-science.com) | [www.figshare.com](http://www.figshare.com) | [www.overleaf.com](http://www.overleaf.com)

## **In Eastern Europe, Russia & CIS**

Igor Osipov, PhD, Digital Science: [i.osipov@digital-science.com](mailto:i.osipov@digital-science.com)

John Hammersley, PhD, Overleaf: [john.hammersley@digital-science.com](mailto:john.hammersley@digital-science.com)

Mark Hahnel, PhD, Figshare: [mark.Hahnel@digital-science.com](mailto:mark.Hahnel@digital-science.com)





**figshare**  
credit for **all** your research

Mark Hahnel, PhD  
CEO & Founder, Figshare





researchers



publishers



institutions



## Why Publishers?

- Path of least resistance
- Author Services

## Why figshare?

- Compliance
- Technology
- Pace of change
- APIs



**SPRINGER NATURE**





# Origin of mounds in the Pantanal wetlands: An integrated approach between geomorphology, pedogenesis, ecology

Jairo Calderari de Oliveira Junior, Raphael Moreira Beirigo, Mariane Chiapini, Alexandre Ferreira do Nascimento,

[Abstract](#)

[Introduction](#)

[Material and method](#)

[Results](#)

[Discussion](#)

[Conclusions](#)

**[Supporting information](#)**

[Acknowledgments](#)

[Author Contributions](#)

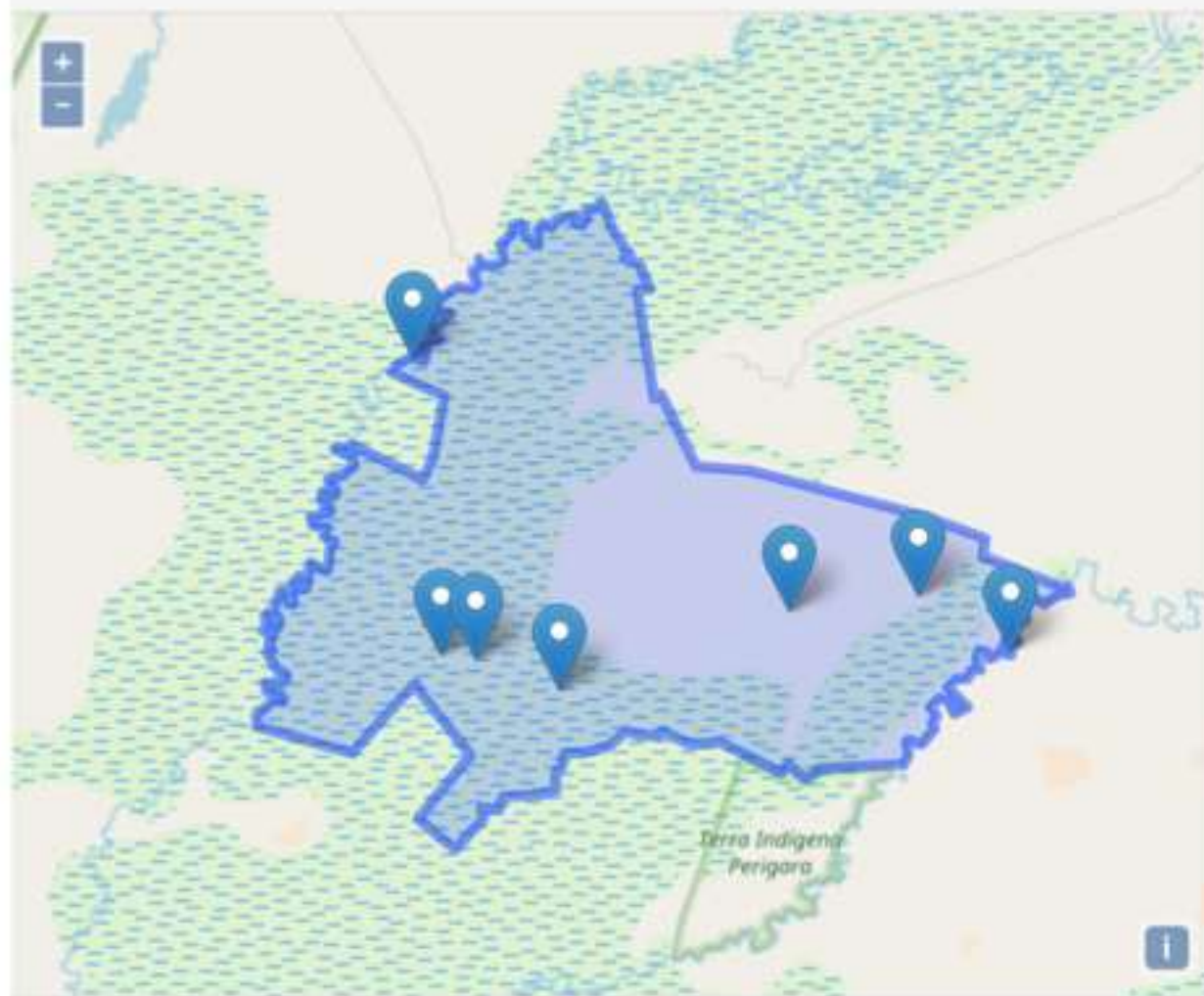
[References](#)

[Reader Comments \(0\)](#)

[Media Coverage \(3\)](#)

[Figures](#)

S1 File.kml



figshare

2 / 2



download







[Browse](#)[Upload](#)[Sign up](#)[Log in](#)

## Create co-occurrence networks

This notebook creates co-occurrence networks and exports them to .gexf files, either at the start of a new book or chapter or over network for all selected books and chapters.

### User variables

```
IN [22]: # which books passages to create co-occurrence networks for
# if it matches the last chapter/section, should also add it to
passages = []
"book1_1" > {chapter1}
# which chapter the co-occurrence network should have
```

[Explore more content](#)

Download with Git and view on GitHub (20/01/2016)

[Cite](#)[Download all \(1.1 MB\)](#)[Share](#)[Embed](#)[+ Collect \(you need to log in first\)](#)

## Using social co-occurrence networks to analyze Biblical narrative

14.02.2016, 15:24 by [Frederik de Vries](#)

Results and code of MSc thesis Artificial Intelligence on VU Amsterdam, with "Using social co-occurrence networks to analyze Biblical narrative" by Frederik de Vries

[Browse](#)[Upload](#)[Sign up](#)[Log in](#)

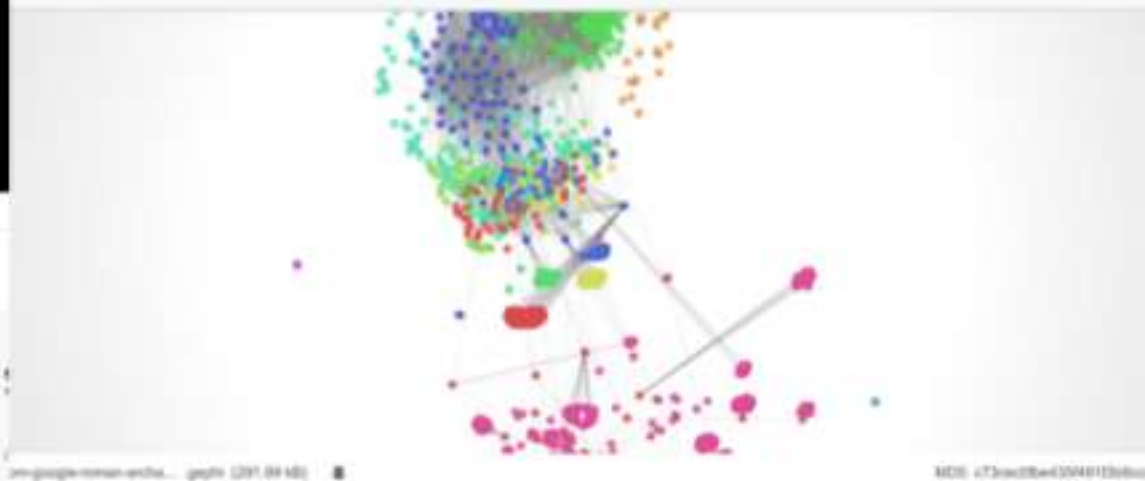
01-Allosaur tooth rooted.stl (5.35 MB)

[Cite](#)[Download all \(5.35 MB\)](#)[Share](#)[Embed](#)[+ Collect \(you need to log in first\)](#)

## UWO-VPC-2013.001-Allosaur tooth rooted

21.02.2014, 21:55 by [Joseph Peterson](#)

Scanned with a NextEngine Desktop 3D Scanner and Scan Studio Pro (NextEngine) on high resolution settings. Model composed of 72,989 vertices and 145,758 faces. Saved as an \*.stl file in MeshLab (v.1.3.2).

[Browse](#)[Upload](#)[Sign up](#)[Log in](#)

an-google-research-archaeological-web (201.04 MB)

MOD: 473ac05e400401030400

[Cite](#)[Download all \(20.4 MB\)](#)[Share](#)[Embed](#)[+ Collect \(you need to log in first\)](#)

1 / 13 < > <img alt="figshare icon" data-bbox="975 805 990 822"/>

## Mapping the Structure of the Archaeological Web

Version 2 25.04.2014, 17:00 by [Shawn Graham](#)

718 views

55 downloads

0 citations

A dataset to accompany an article in a special issue of *Internet Archaeology*. In this article, I map the structure of the web to understand the context of archaeological blogging.







Code S1.PY

94.56 kB



Code S2.PY

17.73 kB



Code S3.IPYNB

262.38 kB

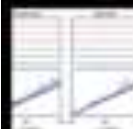


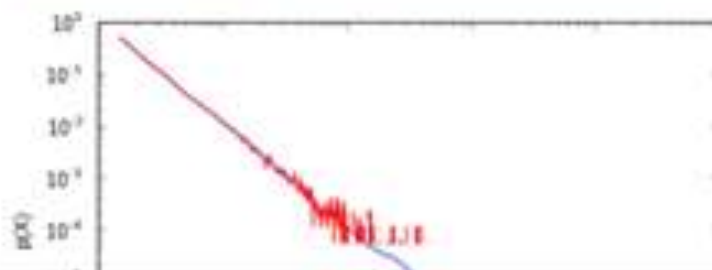
Figure S1.TIFF

8.95 MB



## PDF Linear vs Logarithmic Bins

```
In [9]: data = words
####
figPDF = powerlaw.plot_pdf(data, color='b')
powerlaw.plot_pdf(data, linear_bins=True, color='r', ax=figPDF)
####
figPDF.set_ylabel("p(X)")
figPDF.set_xlabel(r"Word Frequency")
figname = 'FigPDF'
savefig(figname+'.eps', bbox_inches='tight')
#savefig(figname+'.tiff', bbox_inches='tight', dpi=300)
```



Code S3.IPYNB

[Download \(262.38 kB\)](#)

Python code to make all figures, as IPython Notebook.  
(IPYNB)



## Supporting authors to bring data to the forefront: a case study on Springer Nature's past, present, and future interest in research data

figshare is a cloud-based repository for supplementary research data, preprints, theses, media, and more. figshare offers publishers, government organisations, and societies portals for grouping and displaying data, as well as viewers for visualizing data directly on the journal article page. For more information, contact [info@figshare.com](mailto:info@figshare.com).

Springer Nature completed a survey of the Viewer with over 320 of their authors.

The following are the key takeaways:

- **Appearance:** 68% rated as good or very good
- **Usage/engagement:** 76% are more likely to look at additional files
- **Submissions:** 62% more likely to submit a manuscript





researchers



publishers



institutions



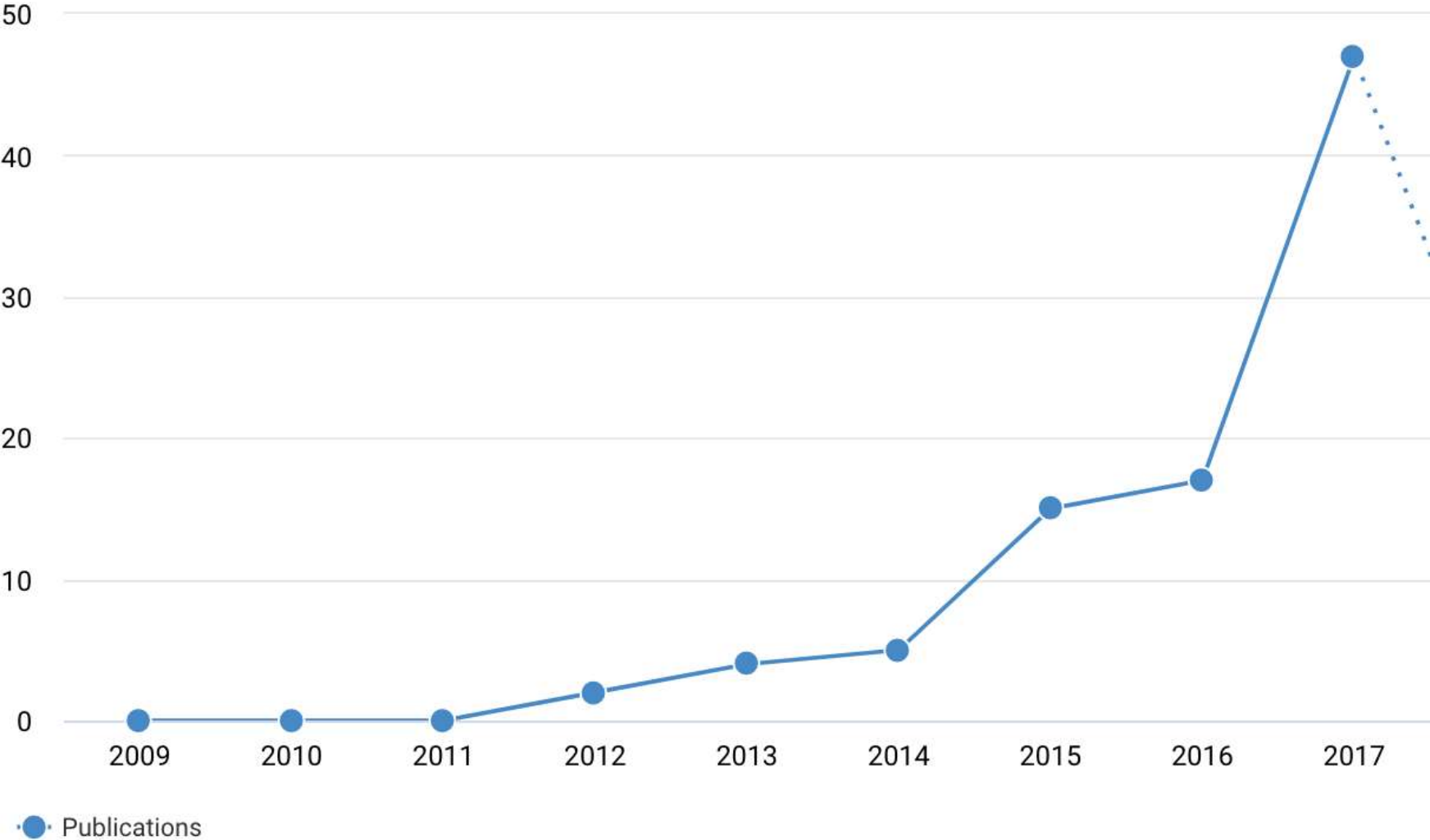




Publications metrics

Ch

● Publications	109	○ Cited / Not cited (%)	65.1 / 34.9	○ RCR Mean
○ Citations	540	○ Citations per publication	5.05	○ FCR Mean
				○ Altmetric (% mentione





Organization Country	↓ Publications Relevant	FCR Mean	RCR Mean	Altmetric A... % mentioned	Altmetric ... Median
<a href="#">Moscow State University (MSU)</a> Russia	23	2.29	1.27	56.5	3.5
<a href="#">Russian Academy of Sciences (RAS)</a> Russia	21	2.91	2.32	61.9	7.0
<a href="#">Saint Petersburg State University (SPbGU)</a> Russia	13	3.72	2.72	46.2	1.5

Name Organization, Country	↓ Publications Relevant	FCR Mean	RCR Mean	Altmetric A... % mentioned	Altmetric ... Median
<a href="#">Stephen J O'Brien</a> Saint Petersburg State University, Russia	4	1.67	0.81	100.0	18.0
<a href="#">Maria D Logacheva</a> Moscow State University, Russia	4	5.14	2.77	100.0	11.0
<a href="#">Dmitrii M Nikolaev</a>	3	0.00	0.00	0.0	0.0
<a href="#">Mikhail N Ryazantsev</a> Saint Petersburg State University, Russia	3	0.00	0.00	0.0	0.0
<a href="#">Maxim S Panov</a> Saint Petersburg State University, Russia	3	0.00	0.00	0.0	0.0



## V. High level Infrastructure



# Single Distributed Codebase



Push

## Infrastructure

- Interface
- Upload
- Download

**Australasia**

**EU**

**Russia**

## Storage

- Buckets
- Cloud
- Local





Uniform  
User  
Experience



Pull

Infrastructure

- Interface
- Upload
- Download

**Australasia**

**EU**

**Russia**

Storage

- Buckets
- Cloud
- Local





## National Non-Traditional Research Output Portal



### Region or subject specific 'Data' Portals



### Portals for each grant code



normalisation and mapping to Funded Grant Code



and Institution using GRID, OverResearch and FundRef

Funded Researcher Uploads

Academic Publisher Datasets  
from e.g. Springer Nature,  
ACS Wiley, etc.

Migration or ingest of  
data from other  
Funded Repositories or  
Institutional Data Repositories

Migration or ingest of data  
from popular repositories  
e.g. Figshare, Dryad, Zenodo



# THANK YOU & CONTACT US

[www.digital-science.com](http://www.digital-science.com) | [www.figshare.com](http://www.figshare.com) | [www.overleaf.com](http://www.overleaf.com)

## **In Eastern Europe, Russia & CIS**

Igor Osipov, PhD, Digital Science: [i.osipov@digital-science.com](mailto:i.osipov@digital-science.com)

John Hammersley, PhD, Overleaf: [john.hammersley@overleaf.com](mailto:john.hammersley@overleaf.com)

Mark Hahnel, PhD, Figshare: [mark@figshare.com](mailto:mark@figshare.com)