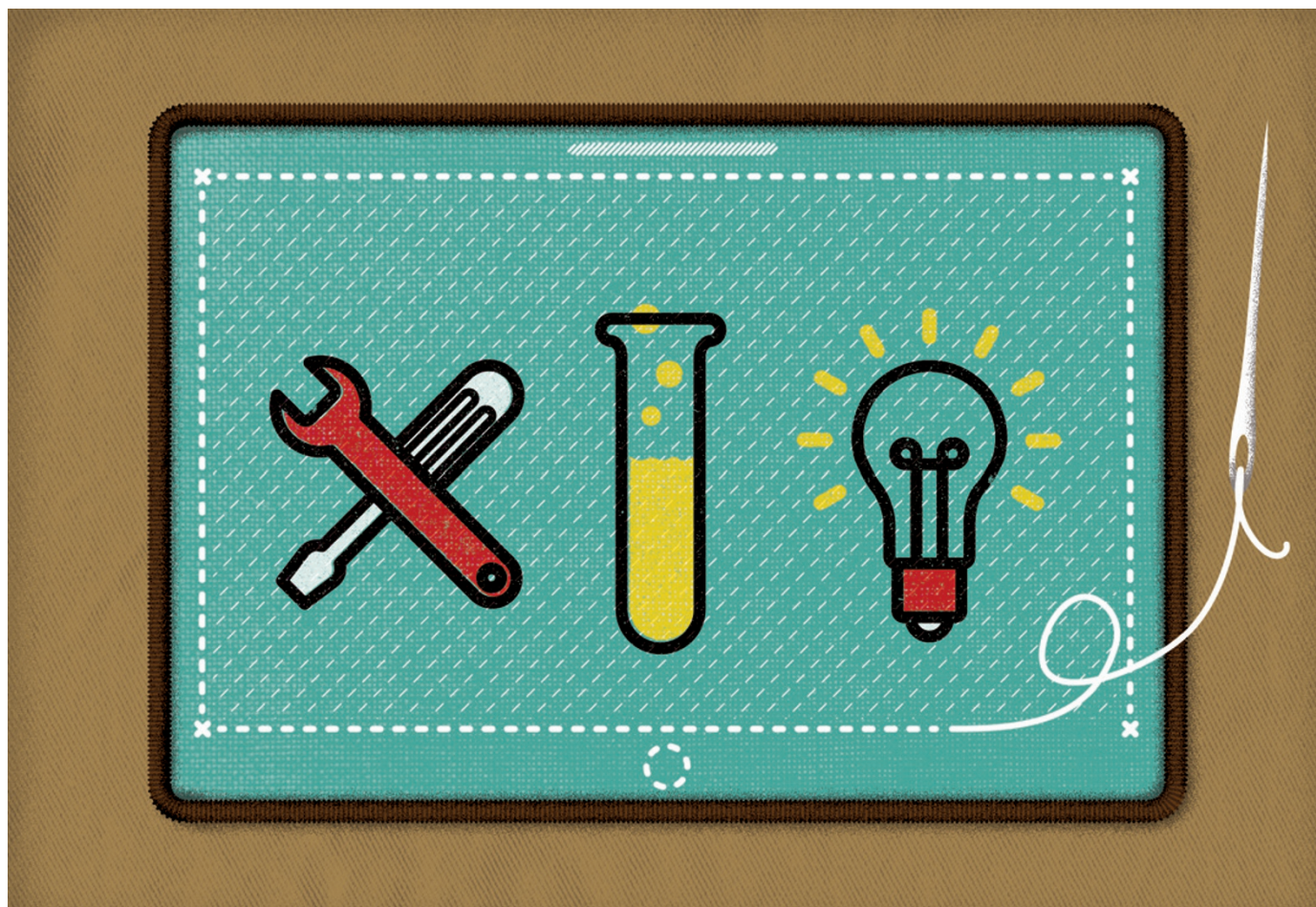# BADGES OF DISTINCTION

A standardized system of digital badges that flag each author's contributions to a research paper aims to enhance collaboration and assign fair credit.

BY DALMEET SINGH CHAWLA

An initiative that uses colourful 'digital badges' to denote different contributions to research aims to standardize and simplify the often-fraught business of detailing who did what on a scientific paper.

Two publishers have begun assigning authors any of 14 badges that delineate the parts they played in a study: from a magenta 'Resources' one (for providing study reagents or instruments) to a red one for writing the initial draft. The badges, says Amye Kenall, associate publisher at BioMed Central in London, could help to minimize the politics of authorship lists, in which supervisors can gain credit for work done by their doctoral students. The project also aims to enhance collaboration by clearly demarcating each contributor's specialities, she says.

On 28 September, the BioMed Central journal *GigaScience* added the badges to two of its published papers. Readers can click to see co-authors listed under multiple badges; the information is also coded in a format that allows computer programs to extract it, which makes it linkable to other online author profiles (such as the researcher identification system ORCID). Another London-based publisher, Ubiquity Press, is also adding badges to two of its published papers.

"In order for information around contribution to be meaningful and useful, it needs to be standardized," Kenall explains. Many papers include author-contributions sections, but their formats vary, and they can be a vehicle for ambiguity — or insider jokes. In one of the papers with badges, author Keith Bradnam, a bioinformatician at the University of California, Davis, is described in the contributions ▶

section as having "herded goats".

The concept has been developed by collaborating publishers, research funders and software firms (which have used digital badges for a few years as a visual sign of achievement). Several other publishers have expressed interest in implementing them, Kenall says, and initial feedback from researchers has been positive.

The 14 categories come from a related 'digital taxonomies' project, which last year brought together journal editors, funders and researchers to classify authors' contributions as a set of standard roles (see L. Allen *et al. Nature* **508,** 312–313; 2014).

"We think it's timely to have a bit more granularity around contributions to scholarly published work," says Liz Allen, a co-founder of the digital taxonomies project. Accurately determining co-authors' roles might also help with grant-funding applications, she adds, because applicants could be more explicit about research contributions.

The taxonomy is still in a rough format, but the badges project is not alone in implementing it, Allen adds. *Cell Press*, for instance, now offers researchers the option to use the taxonomy when submitting papers; so far, it has published two papers that do so — although without the badges.

But contributions to scholarly products may be too varied to be captured with a 14-part taxonomy, says Melissa Haendel, who develops systems for querying and classifying biological data at Oregon Health & Science University in Portland. Haendel co-chairs a working group as part of FORCE11, a community-driven initiative that aims to improve scholarly communication technologies and policies. The group is mapping out author roles, in part by using computer programs to search the text of author-contributions sections on papers.

A January workshop in Oxford, UK, listed more than 500 tasks that authors might want to be credited for, she says; examples include developing experimental protocols, taking photographs, developing validated surveys or providing lab reagents.

The badges that a researcher might collect could easily be extended, Kenall notes; extra categories could credit peer reviewers, for example. But for now, BioMed Central is focusing on collecting data about how often people click on the badges, before advancing conversations with funders, publishers and researchers about their practicality, and rolling out the badges to other journals.

"Unlike a CV or author-contributions section, badges provide a method of credit and transparency around contribution fit for purpose for a digital world," Kenall says. ■

Editor's note: Dalmeet Singh Chawla worked at BioMed Central until June 2014, but had no involvement with the badges project.

The journal that publishes no papers

Mathematics journal 'overlays' arXiv preprint server.

BY PHILIP BALL

New journals spring up with overwhelming and almost tiresome frequency these days. But *Discrete Analysis* is different. This journal is online-only — but it will contain no papers. Rather, it will provide links to mathematics papers hosted on the preprint server arXiv. Researchers submit their papers directly from arXiv to the journal, which evaluates them using conventional peer review.

With no charges for contributors or readers, *Discrete Analysis* will avoid the commercial pressures that some feel are distorting the scientific literature, in part by reducing its accessibility, says the journal's managing editor Timothy Gowers, a mathematician at the University of Cambridge, UK, and a winner of the prestigious Fields Medal.

"Part of the motivation for starting the journal is, of course, to challenge existing models of academic publishing and to contribute in a small way to creating an alternative and much cheaper system," he explained in a 10 September blogpost announcing the journal. "If you trust authors to do their own typesetting and copy-editing to a satisfactory standard, with the help of suggestions from referees, then the cost of running a mathematics journal can be at least two orders of magnitude lower than the cost incurred by traditional publishers."

The cost to the journal is only US$10 per submitted paper, Gowers says; money required to make use of Scholastica, software that was developed at the University of Chicago in Illinois for managing peer review and for setting up journal websites. (The journal also relies on the continued existence of arXiv, whose running costs amount to less than $10 per paper). A grant from the University of Cambridge will cover the cost of the first 500 or so submissions, after which Gowers hopes to find additional funding or ask researchers for a submission fee.

OVERLAY JOURNALS

The idea of an 'overlay' journal that links to papers hosted on a preprint server is not new. There are arXiv overlay journals in maths already, such as *SIGMA* (*Symmetry, Integrability and Geometry: Methods and Applications*) and *Logical Methods in Computer Science*.

But Gowers' announcement is likely to widen interest in the idea because of his influence in the mathematics community — and outside it.

Three years ago, a blogpost announcing Gowers' personal boycott of the Dutch publishing giant Elsevier helped to spark the 'Cost of Knowledge' movement, which has seen more than 15,000 researchers variously pledging not to publish with, referee for or do editorial work for Elsevier.

And in 2013, Gowers announced his involvement with an initiative called the Episciences project, in which mathematicians decided to launch a series of overlay journals (see *Nature* http://doi.org/kwg; 2013). That uses the multidisciplinary archive HAL, a preprint server that mirrors arXiv and is hosted in Lyons, France. One of its leaders, mathematician Jean-Pierre Demailly of the University of Grenoble in France, admits that progress has been sluggish. "The technical development of the Episciences platform took about a year and a half longer than initially envisioned," he says. "However, things are now coming along nicely." The initiative now has five or six staff, Demailly says, and operates three computer-sciences journals and one in maths, which charge nothing to publish.

Episciences would have been a suitable platform to support *Discrete Analysis* too, Gowers says, but he happened to have sufficient funds to use the Scholastica software, and opted for that instead. "I hope that in due course, people will get used to this publication model," he adds, and that "the main interest in the journal will be the mathematics it contains". A temporary website on the Scholastica platform will receive submissions before the journal launches early next year.

Gowers says that the model could be extended to other fields. The question, perhaps, is how readily researchers will embrace it. "Apart from being an arXiv overlay journal, our journal is very conventional, which I think is important so that mathematicians won't feel it is too risky to publish in it," says Gowers. "But if the model becomes widespread, then I personally would very much like to see more-radical ideas tried out as well" — for example, post-publication review and non-anonymous referees. ■