

## **Sensemaking Networks: Transforming Social Media into a Sensemaking Layer for Science**

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### **Extended Abstract**

Our project, Sensemaking Networks, aims to address three interrelated limitations of current science publishing and communication processes: (1) poor reach and feedback, (2) knowledge fragmentation, and (3) rigid formats. To address these issues, Sensemaking Networks combine two promising trends in science publishing and communication: science social media and semantic nanopublishing.

#### **Social media: the ‘dark matter’ of the scientific research universe**

Science social media is playing an increasingly significant role in key scientific processes, including evaluation, curation, and science communication. The mere fact of being tweeted by “science influencers” dramatically increases citation counts [1]. Social media discussions inspire new research directions, provide rapid feedback, and directly involve the broader public in current scientific discourse. The rise in social media's popularity can be viewed as a natural response to the limitations of traditional approaches like peer review and citation-based metrics [2], [3], which are struggling to keep up with the challenges posed by science in the digital age. However, despite exerting a very real impact on science, social media is not officially on the scientific record, both technically and conceptually. Technically, science social media data is not open and FAIR (Findable, Accessible, Interoperable and Reusable) [4]; rather, it is fragmented across a multitude of apps and formats, and increasingly enclosed for profit by commercial platforms [5]. Conceptually, science social media is also off the record; e.g., not seen as a part of “real science”.

#### **Semantic nanopublishing: from posting to co-creating knowledge graphs**

Research papers have remained the basic unit of the traditional science record, despite many efforts at introducing new kinds of outputs, such as data or code. Beyond the diversification in *types* of outputs, another notable recent trend is the diversification in *scale* demonstrated by micro and nano-publishing [6], [7], [8]. As the name implies, nanopublications are formal, citable research objects aimed at representing very small units of knowledge - typically corresponding to a few sentences in natural language. Nanopublications employ Semantic Web principles to represent publications as small knowledge graphs, enabling unambiguous and machine-actionable representation of information. Nanopublications are also diverse: they can express virtually any kind of knowledge, from a relation between a gene and a disease, to an opinion about a scientific paper or a blog post. Their diversity, combined with machine readability, means that nanopublications, unlike social media posts, can power a wide range of downstream applications, from comment feeds over papers, to open peer review systems [9]. Nanopublishing is particularly intriguing in the context of science social media, since in many cases, *scientists on social media are already nanopublishing, but they just don't know it*

yet. E.g., the only obstacles preventing a spicy Twitter take on a recent paper from becoming a nanopublication are (1) open and FAIR access to the post, and (2) a structured semantic representation of the information conveyed by the natural language text.

### **Sensemaking Networks: FAIR and semantic social media**

We envision Sensemaking Networks as decentralized, Twitter-style social networks where posts are nanopublications, and data is open and FAIR. This approach aims to draw on the best of social media networks in terms of feedback and reach, while addressing their limitations of siloed data and lack of machine-readable semantics. Conversely, embedding nanopublications in social networks enhances their “aliveness” and discoverability, thus encouraging their adoption by researchers who want to not only publish, but also engage with other researchers and the broader public. As a first step towards implementing Sensemaking Networks, we are building an AI-powered social media FAIRification service to substantially reduce the technical barriers to nanopublishing. Scientists will be able to connect their feeds to the service to automatically detect potential nanopublications, complete with semantics inferred from their posts’ content.

### **Adding a sensemaking layer to the scientific record**

Both nanopublishing and science social media challenge our notions of what science is and what it could be [9], [10]. We think that their integration realizes a powerful synergy; a sensemaking layer for science that helps us to collectively synthesize, disseminate and evaluate research. By intentional design of social technology, and by expanding our conceptions of research, we can cultivate more adaptive and democratic scientific processes.

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