Definitional drift: Human–AI collaboration with MatSci-YAMZ

(An Interactive Demonstration)

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MatSci-YAMZ, a Very Brief Overview

- Collaborative vocabulary application where users can define terms of relevance
- Stackoverflow-style voting and commenting to determine the most relevant or “best” definitions
- Allows users to provide definitions which capture and accentuate meanings which may be novel or discipline specific
- Communities can vote on terms which best fit their collective understanding
- Integrates Gemma 3.27b LLM to produce alternate definitions
- LLM support allows for alternative definitions based upon broader linguistic pool of sources
- Why is this important?
    - Findable, Accessible, Interoperable, Reusable (FAIR) Data
    - Improved communication in publications by reducing ambiguity in usage
    - Clarification of terminology which is more fluid

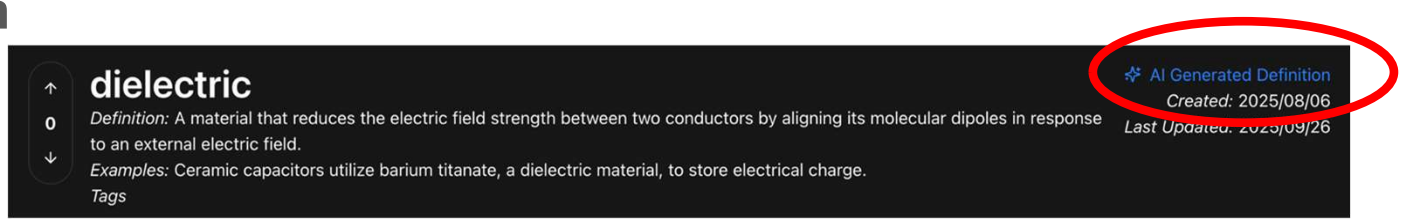
MatSci-YAMZ, an Extremely Brief Overview

- Website where communities of users can define terms
- Stackoverflow-style voting and commenting to find best definitions
- Understand the differences between LLM- and human-generated definitions
- Integrates Gemma 3.27b LLM to produce alternate definitions
- Why is this important?
  - Findable, Accessible, Interoperable, Reusable (FAIR) Data
  - Improved communication by reducing ambiguity in usage
  - Clarification of terminology which is more fluid

Time to participate!

Go to matsci.yamz.net, log in using a Google account

Browse terms, find one you have opinions about, **find the AI Generated Definition**



- If no terms speak to you, take **2-3** minutes to add one, then look at its AI-Generated twin.

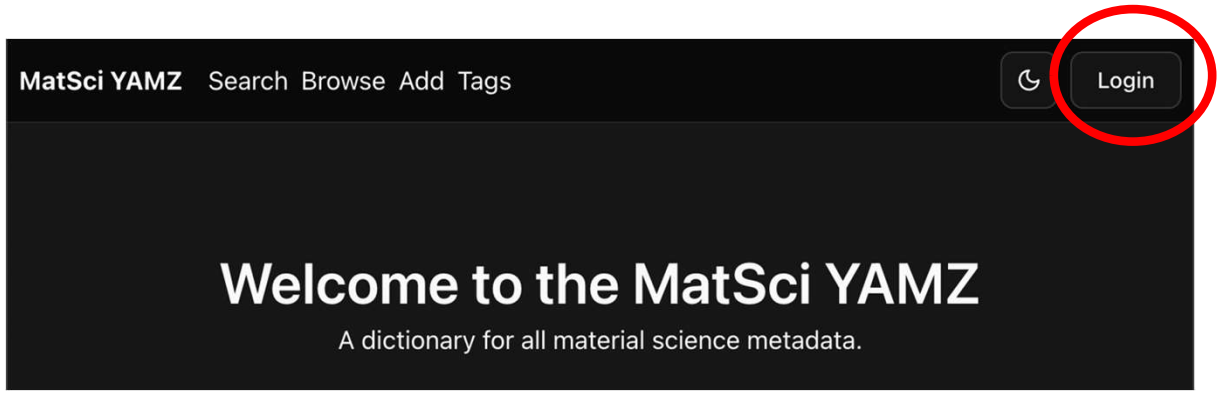
Please **comment on the AI-generated terms.** Comments will cause the LLM to update the definition, so **refresh after commenting!**

Up-vote up or down-vote terms.

https://matsci.yamz.net

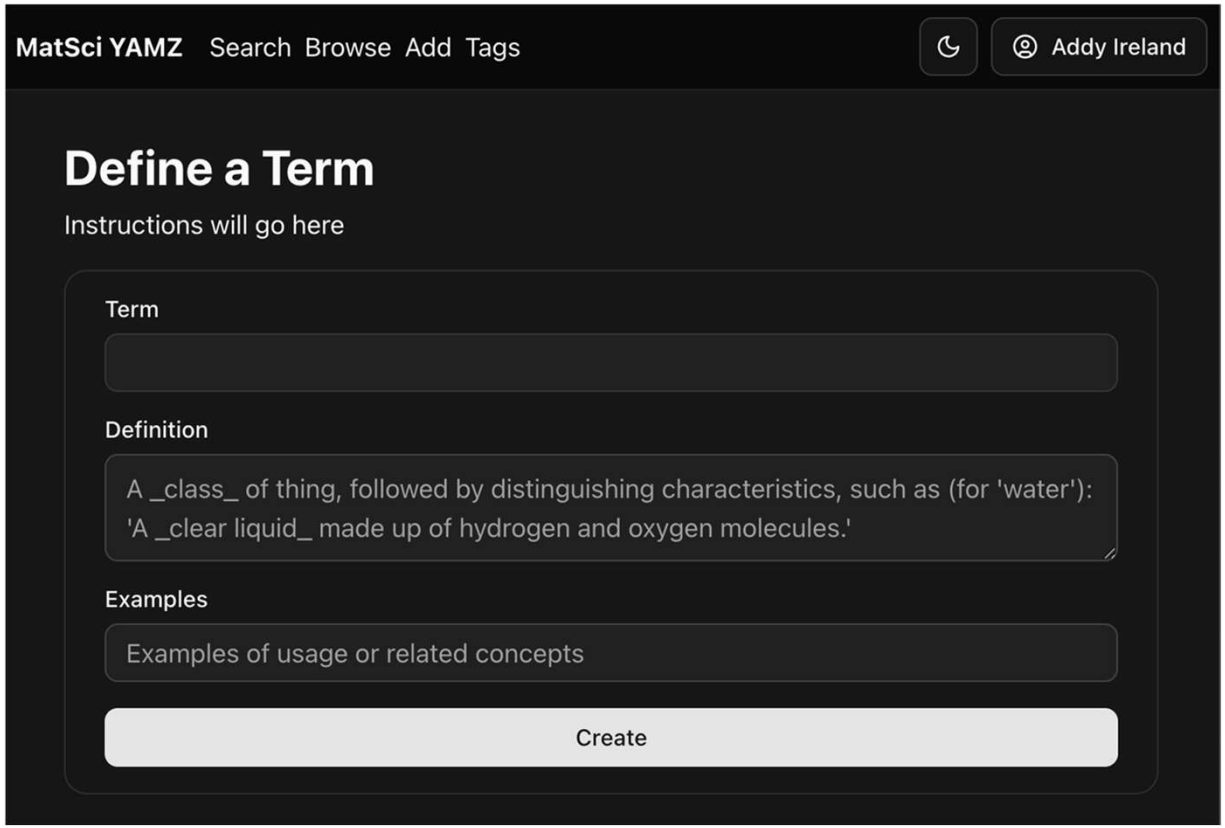
First Steps

- Getting Started
  - Go to https://matsci.yamz.net or use the QR code
  - Start by logging in, updating your profile, and saving your changes
- Tabs Overview
  - **Search**: Search terms and definitions
  - **Browse**: Browse through terms and how many definitions they each have
  - **Add**: Create a definition
  - **Tags**: Browse through tags and definitions associated with them



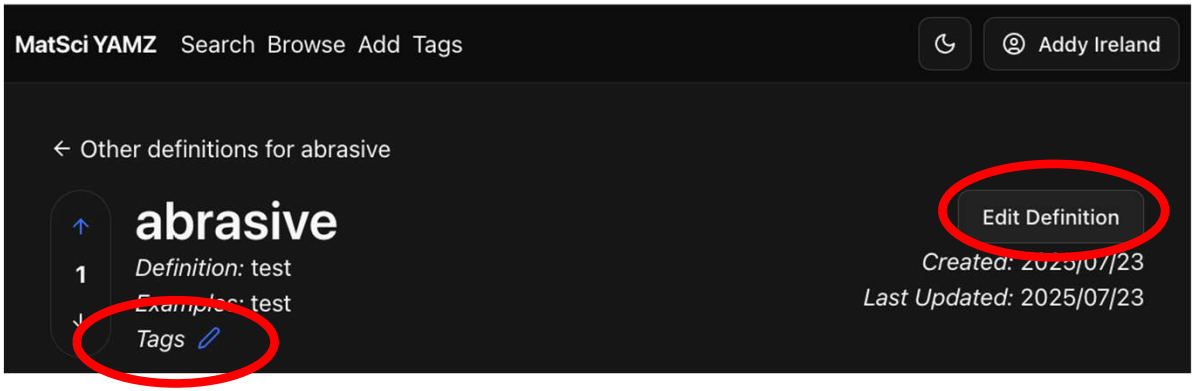
Creating a definition

- Enter your term
  - Either define a new one or select one from the dropdown
- Enter a definition and example
  - Can be as brief or extensive as necessary
  - Example is required
- Finally, create your definition
  - You can also edit your definition after posting it



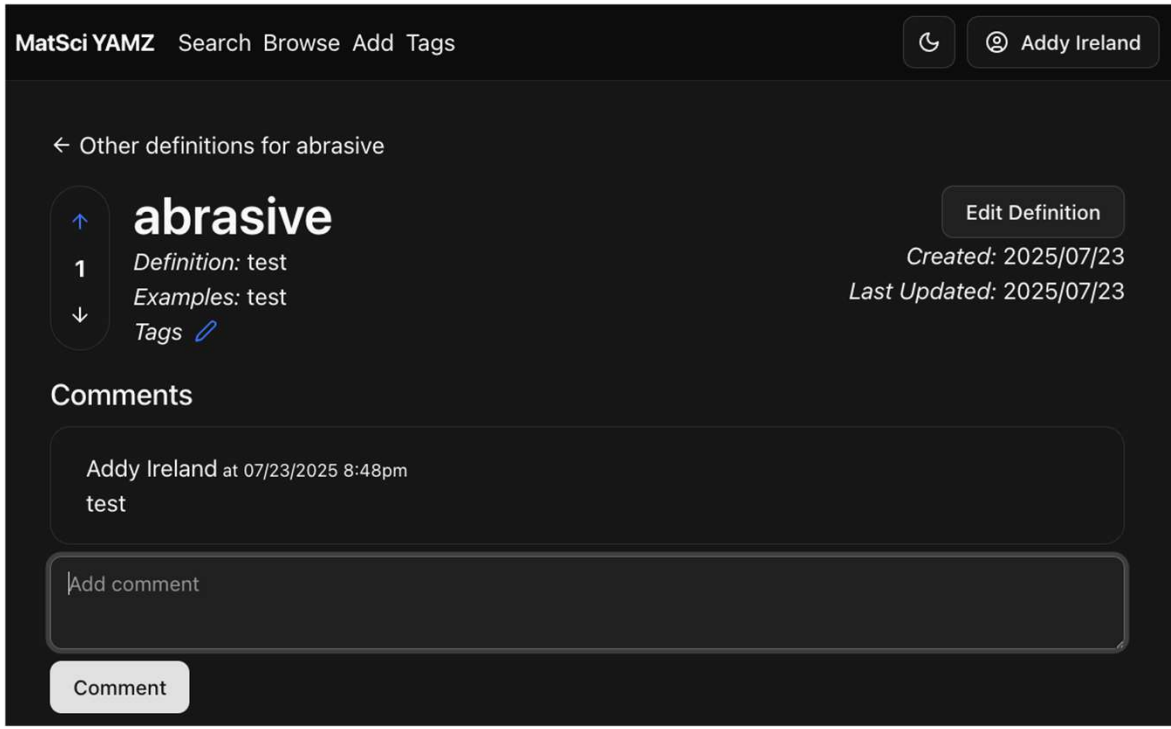
Editing Your Definition

- Once you've created a definition…
- Edit it by clicking the "Edit Definition" button
- Tags, to denote community or category
  - New tags can be created by clicking the tags button and clicking "Add Tag"
  - Add a tag by clicking the blue edit button next to tags
- Browse all your definitions by
  - Clicking your name in top right, then selecting "Definitions" from the dropdown



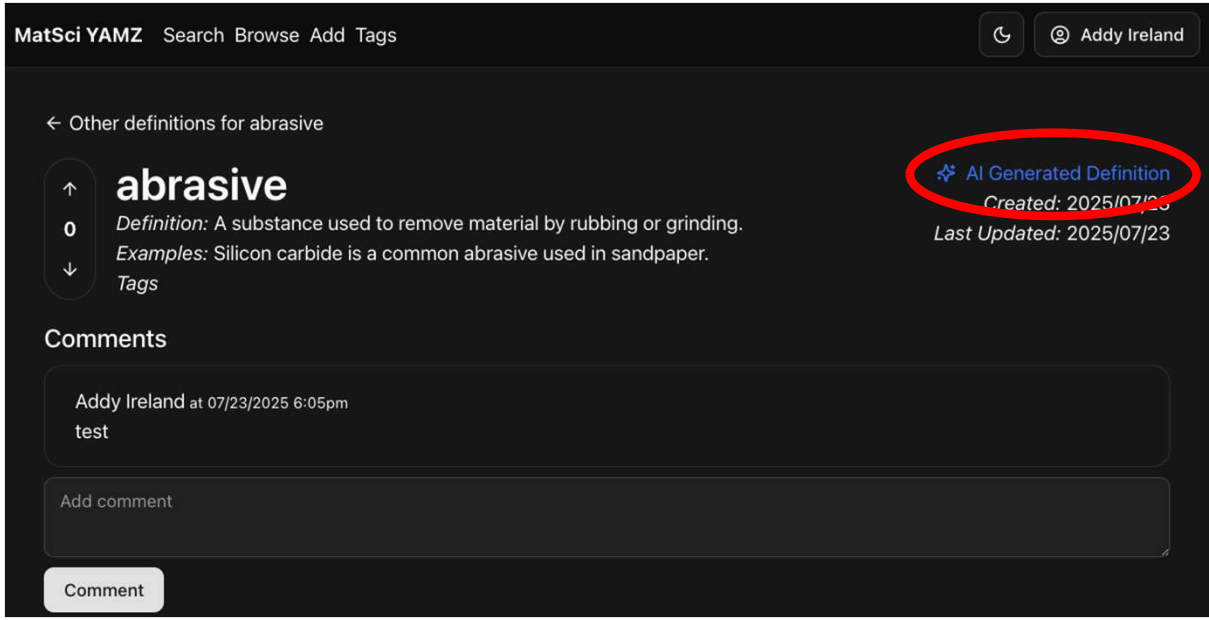
Commenting + Voting

- Find terms by going to the search or browse tab
- Upvote/Downvoting
  - Vote for the best definition using the up/down arrows
- Comments
  - Post a comment by writing in the “Add comment” box and clicking comment



AI Definitions

- Denoted by “AI Generated Definition”
- Automatically generated from user-provided examples by an LLM (Gemma3)
- LLM refines its definition based on users’ comments to it



Feedback

Let us know what works (and what doesn't), what features we might incorporate, or any other thoughts on MatSci-YAMZ.

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Thank you!
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Questions?

Citations

McClellan, S., de Oliveira, I. M., Rauch, C., Adriaenssens, S., & Greenberg, J. (2024). Exploratory analysis of a crowdsourcing metadata tool for building terminological consensus in civil engineering. *Automation in Construction*, *166*, 105627-. https://doi.org/10.1016/j.autcon.2024.105627

Greenberg, J., McClellan, S., Rauch, C., Zhao, X., Kelly, M., An, Y., Kunze, J., Orenstein, R., Porter, C., Meschke, V., & Toberer, E. (2023). Building Community Consensus for Scientific Metadata with YAMZ. *Data Intelligence*, *5*(1), 242–260. https://doi.org/10.1162/dint_a_00211