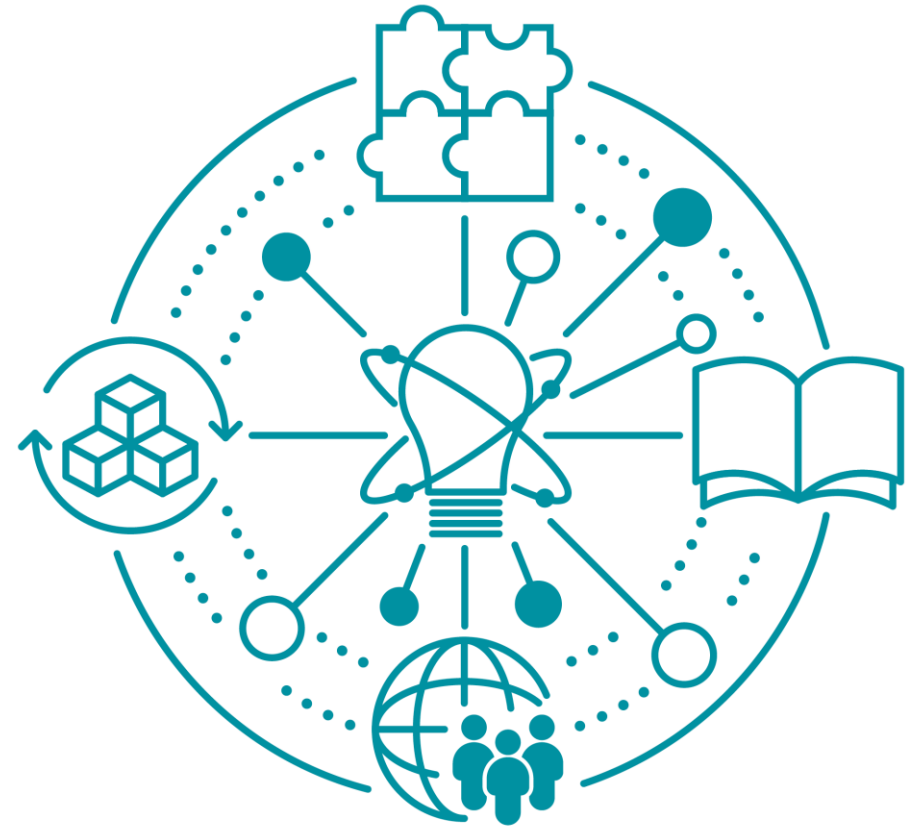


Open Research & A Case Study on Generative Audio AI

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UNIVERSITY OF SURREY

Open Research



Outline



- » What is Open Research and Why (~ 3 minutes)
- » Open Research Working Group (ORWG) (~ 3 minutes)
- » Open Research Survey (~ 3 minutes)
- » A Case Study on Generative Audio AI from CVSSP Audio Team (~ 6 minutes)

Acknowledgements to Prof Emily Farran, Dr Emma Henderson and Mr Haohe Liu for sharing their slides.

What is Open Research?



» **Open Research is
scholarly research
that is:**

» Collaborative

» Transparent

» Reproducible

» And whose outputs are
publicly available

Open Research practices include:

- Open Access to outputs;
- Data preservation and sharing;
- Pre-registration of study designs;
- Using digital tools to manage, document and publish research methods or protocols;
- Use of Open-Source programming;
- Development of Open Research software or hardware;
- Use of preprints and open peer review to accelerate dissemination/ increase transparency

Why Open Research?



- **Research quality and reproducibility**
 - Open methods enhance scrutiny, increase quality control and produce more reliable and reproducible results
- **Research integrity**
 - Transparency about process means more trust in results
- **Re-use of research and value creation**
 - More outputs made accessible to and usable by more people
 - More use = greater value generated from research

Open Research Community at Surrey



- » Surrey Open Researcher Community Team
- » Open Research Champions Team channel
- » Open Research Champions meetings (twice a year, or more if required)
- » Open Research Working Group

Surrey Open Research Working Group



[About Surrey Open Research Working Group](#)

[Surrey ORWG Terms of Reference](#)

“Surrey Open Research Working Group (ORWG) is an action-oriented team of researchers and professional services. Aligned with the University of Surrey Open Research strategy and Action plan, the group’s central aim is to advance Open Research practice across the University, with the goal of making the processes and products of research at the University of Surrey as transparent, accessible and reproducible as possible. This is being achieved by the following objectives:

- 1. Embracing, adopting, promoting and embedding transparency and Open Research across the University community.*
- 2. Celebrating, showcasing and rewarding Open Research.*
- 3. Supporting an increase in awareness, knowledge and practice in the University community of Open Research practice.*
- 4. Establishing systems to monitor the adoption of Open Research practices across the University community.*
- 5. Advancing the Open Research agenda, nationally and internationally.”*

Surrey Open Research Working Group



- » University wide ORWG
- » Launched 25th February 2020.
- » Collaborate with Surrey Reproducibility Society (SRS) and UK Reproducibility Network (UKRN) Local Network Leads (LNL)
- » Members
 - Open Research team (library)
 - Associate Deans Research and Innovation for each Faculty
 - Dean of the Doctoral College
 - HR representative
 - Marketing and Communications representative
 - Ethics and Governance representative
 - Academic representative from each Faculty
 - President of SRS
 - UKRN LNL
 - UKRN project officer and Higher Education Innovation Funding (HEIF) postdoc
 - (Head of library)
- » Meet every 6 weeks online for one hour, bullet points widely circulated after the meeting.

Open Research Initiatives at Surrey



- » [Open Research Working Group](#)
- » [Surrey University Open Research Questionnaire 2020](#)
- » [Socialising Open Research across all disciplines](#)
- » [Open Research strategy and action plan](#)
- » Open Research Logo
- » Position statements: [Open Research](#) / [Responsible Metrics](#)
- » Approval to sign [DORA](#)
- » Common procedures: [Open Access Policy](#), [Data Management Policy](#)
- » [Open Research community \(Teams\)](#)
- » [Research Culture annual lectures](#)
- » [Open Research training and badges](#)
- » [Open Research awards](#)
- » [Open Research case studies](#)
- » [Open Research YouTube channel](#)
- » Hiring / Promotion criteria



Support (website)



[LIBRARY](#) > [OPEN RESEARCH](#)

[Introduction](#) | [Getting started](#) | [Open Research in Practice module](#) | [Teams](#) | [Open Access](#) | [Preprints](#) | [More](#) ▼



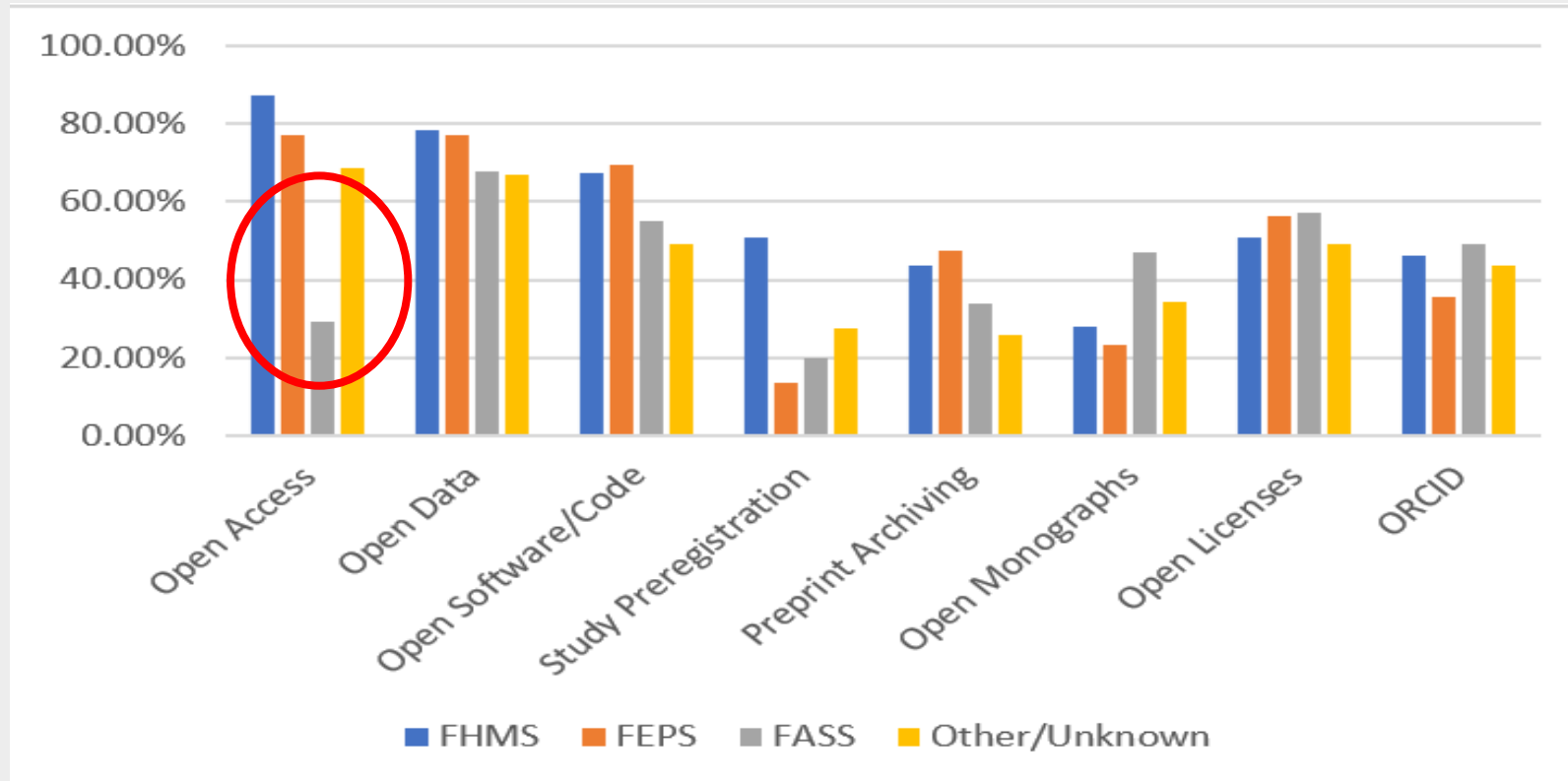
OPEN RESEARCH

Open Research - used interchangeably with Open Science - is a set of values and practices that seek to make research easily discoverable, transparent, publicly available and re-usable. The aim of our Open Research initiative is to foster a collaborative and inclusive research culture; to spur innovation and creativity; and, where applicable, to support the reproducibility of research findings.

Open Research Survey – 2020



Open Research practices perceived as very important/ important (Open Research Survey, 2020)



- Most important: Open access and open data. Perceived importance was associated with whether the respondent accessed that practice.
- Open access: differs by faculty.

Open Research Survey – 2023

- » Survey commissioned as part of the UKRN Open Research Programme
- » Ran across 15 universities at the start of 2023
- » **UKRN:** 14 OR topics – priority, engage in activity, training
- » **Surrey:** 9 OR topics - awareness, sharing data, barriers & enablers, training, responsible metrics, research culture
- » **Goals:**
 - Monitor Open Research awareness, attitudes, and behaviours
 - Understand barriers and incentives related to Open Research practices
 - Ultimate aim to better support our researchers
 - UKRN goal to identify training needs

Greatest Barriers to Open Research 2020 vs 2023

	2020 %	2023 %	difference
Lack of dedicated funding	19.7	23.6	3.9
Lack of time	13.2	22.7	9.5
Lack of positive incentives	13.0	12.8	-0.2
I am unfamiliar with open research practices	10.8	7.4	-3.4
Other. Please explain:	6.3	6.9	0.6
Lack of information or training	16.4	6.4	-10.0
Lack of mandates from funders, institutions or regulators	9.6	4.9	-4.7
The level of adoption of open research practices in my field is already sufficient	1.4	4.9	3.5
Lack of support from senior researchers (e.g., supervisors and principal investigators)	3.4	4.4	1.0
Lack of supporting infrastructure (e.g., sufficient storage for open data / publishing platform for open monographs)	6.0	4.4	-1.6
Lack of interest from junior researchers	0.2	1.5	1.3

Specific Sources for Information 2020 vs 2023

	2020 %	2023 %
Surrey Open Research webpages	NA	40.0
Surrey Open Research training module	NA	31.8
Supervisor / Line manager / Surrey peer or colleague	22.9	27.2
Literature	38.1	24.6
Surrey Open Research Team at the library	17.7	24.6
Other Surrey training / workshops / conferences	8.6	21.5
Non-Surrey peer or colleague / Networking at conferences	37.6	15.4
I don't seek guidance on Open Research practices	NA	14.9
Social media	18.4	13.8
Common practice in the department or lab	26.3	13.3
Publisher	18.4	13.3
External training / workshops / conferences	NA	12.3
Funder	9.6	10.8
Mailing list / Forum / Wiki	10.8	8.2
My Faculty Engagement Librarian (FEL)	4.2	6.2
Professional Society	11.1	6.2
Other (please specify)	14.3	4.1
Surrey innovation / Legal team (re IP)	NA	2.6

Open Research Practice – A Case Study about Promoting Research on Generative Audio AI

- **General public:**

- Interactive Demo
- Video Introduction
- Media Coverage
- Discord Community
- ...

- **Academic:**

- Model training code
- Open-access database
- Pretrained model
- Open-licensed paper
- Open paper review
- ...

- **Professional:**

- Web API
- Python Package
- GitHub Code
- ...

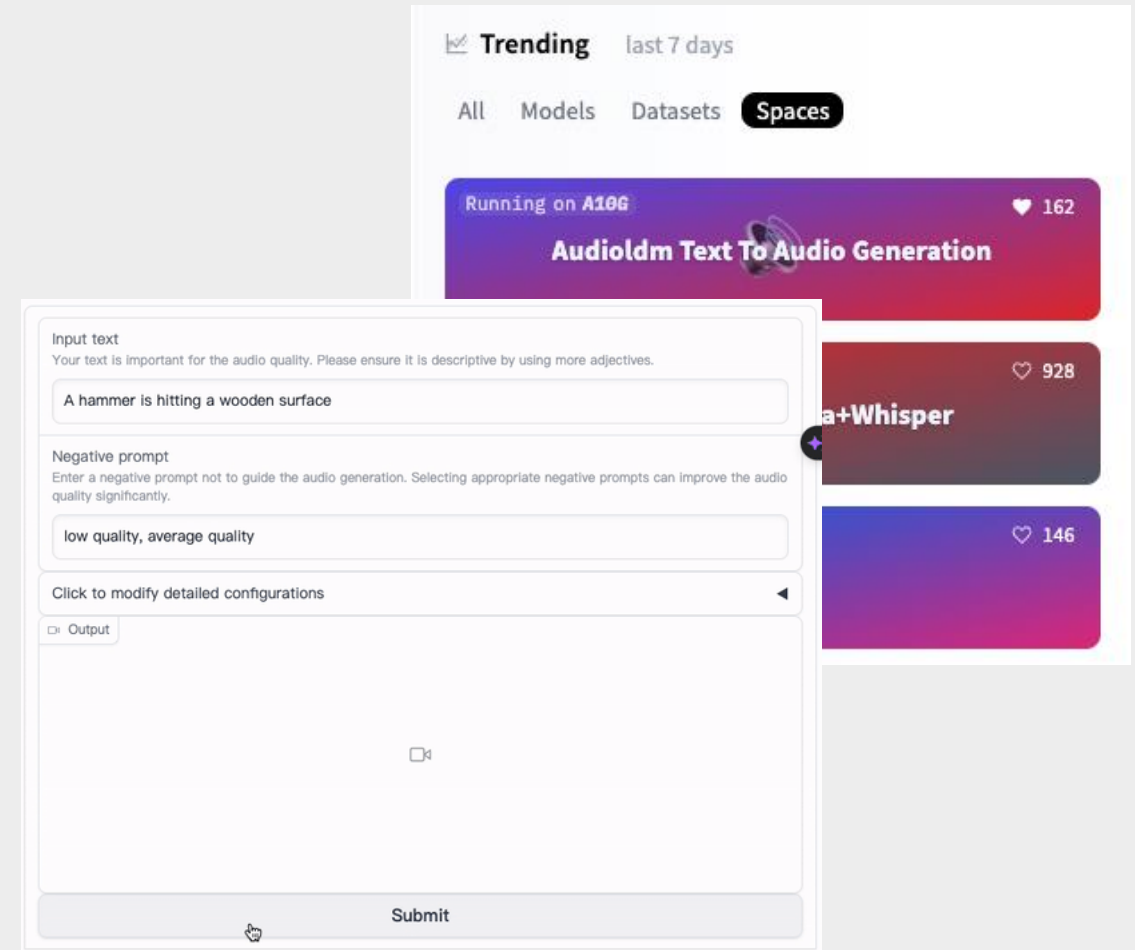


AudioLDM: Text-to-audio generation with latent diffusion models,
Haohe Liu, Zehua Chen, Yi Yuan, Xinhao Mei, Xubo Liu, Danilo Mandic,
Wenwu Wang, and Mark D. Plumbley,
Proceedings of the International Conference on Machine Learning (ICML),
2023

Open Research Practice for General Public

- User can try out our model on any device with a browser
- Was ranked the **1st popular space** out of a total of **140,000 spaces** (Feb 2023)
- **Collaboration with HuggingFace**

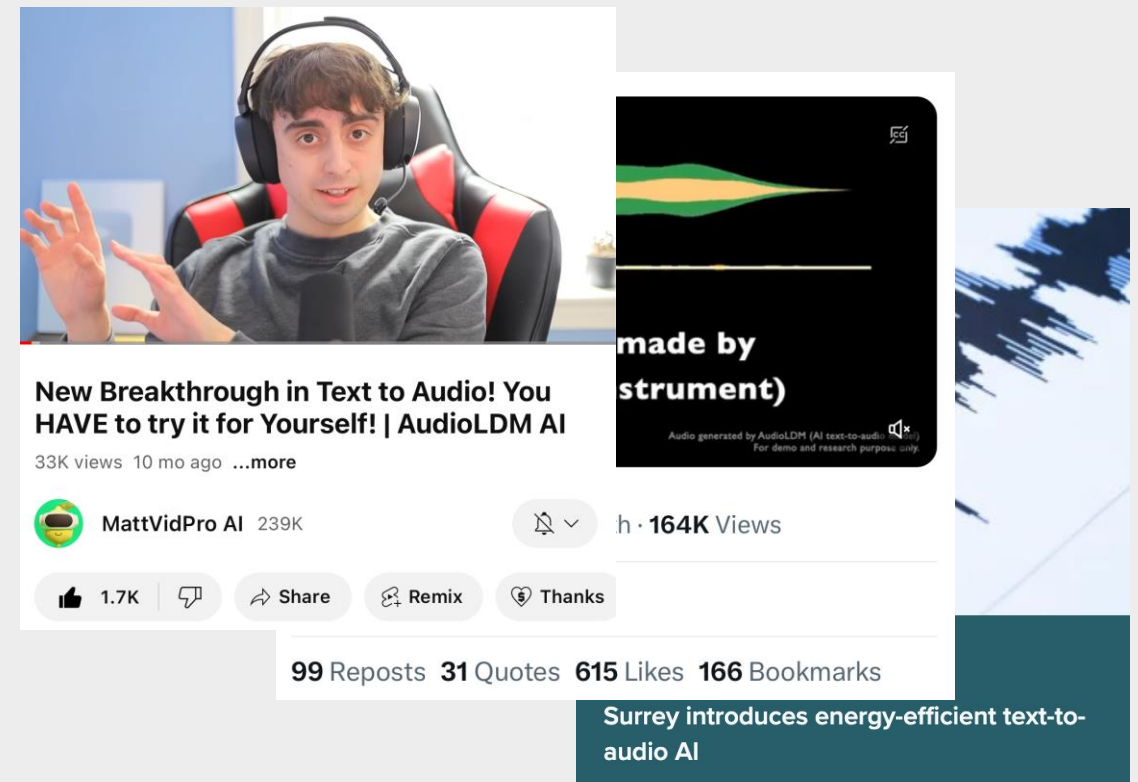
Note: HuggingFace is a platform that hosts and collaborates on AI models, datasets, and applications.



The screenshot shows a HuggingFace Space interface. At the top, there's a 'Trending' section for the 'last 7 days' with tabs for 'All', 'Models', 'Datasets', and 'Spaces'. Below this, a list of spaces is shown, including 'Audioldm Text To Audio Generation' (162 likes), 'a+Whisper' (928 likes), and another space (146 likes). The main interface for 'Audioldm Text To Audio Generation' is displayed, featuring an 'Input text' field with the prompt 'A hammer is hitting a wooden surface', a 'Negative prompt' field with 'low quality, average quality', and a 'Submit' button. The output area is currently empty.

Open Research Practice for General Public

- Utilize social media properly
- 164K views on Twitter
- 57K impressions on LinkedIn
- Covered by a YouTuber with 239K subscriptions
- A Discord community of 150+ people
- Demo Page (1st traffic source for our GitHub)
- ...



Open Research Practice for Academic

- **Code, dataset, and papers.**
- Training recipe open-sourced on GitHub
- Dataset details publicly available
- Papers are openly available, for example, in the Surrey Open Research Repository, arXiv, etc.
- **4000+ stars on GitHub**, where usually 100 stars is already an excellent milestone for most projects.
- **200+ citations** within a year of publication.

Note: GitHub is a code hosting platform for version control and collaboration.

Other

AudioLDM: Text-to-Audio Generation with Latent Diffusion






Models

by Haohe Liu, Zehua Chen, Yi Yuan, Xinhao Mei, Xubo Liu, Danilo Mandic, Wenwu Wang and Mark Plumbley

Published 09/09/2023

arXiv.org



 AudioLDM	2.1k ☆
 voicefixer	817 ☆
 AudioLDM2	1.9k ☆
 versatile_audio_super_resolution	743 ☆
 audioldm_eval	234 ☆

Open Research Practice for Professionals

- Our open-sourced model weight have been downloaded **over 25,000 times**
- The Python package we open-sourced has been installed over **40,000 times**
- **Collaborated with HuggingFace** to build our model into the Python Library *Diffusers*

```
class diffusers.AudioLDMPipeline
```

[Open in Colab](#)[Replicate](#)[Demo & Cloud API](#)

Note:

- *Diffusers* is a popular AI-related Python package that has an average download of **2M per month**

Benefits

Open-source Community

- Multiple incredible open-source projects were built based on the open-sourced code

e.g.,
Image to audio
AI Music album

Industry

People from industry get inspired and start to work on related topics

Personal and University

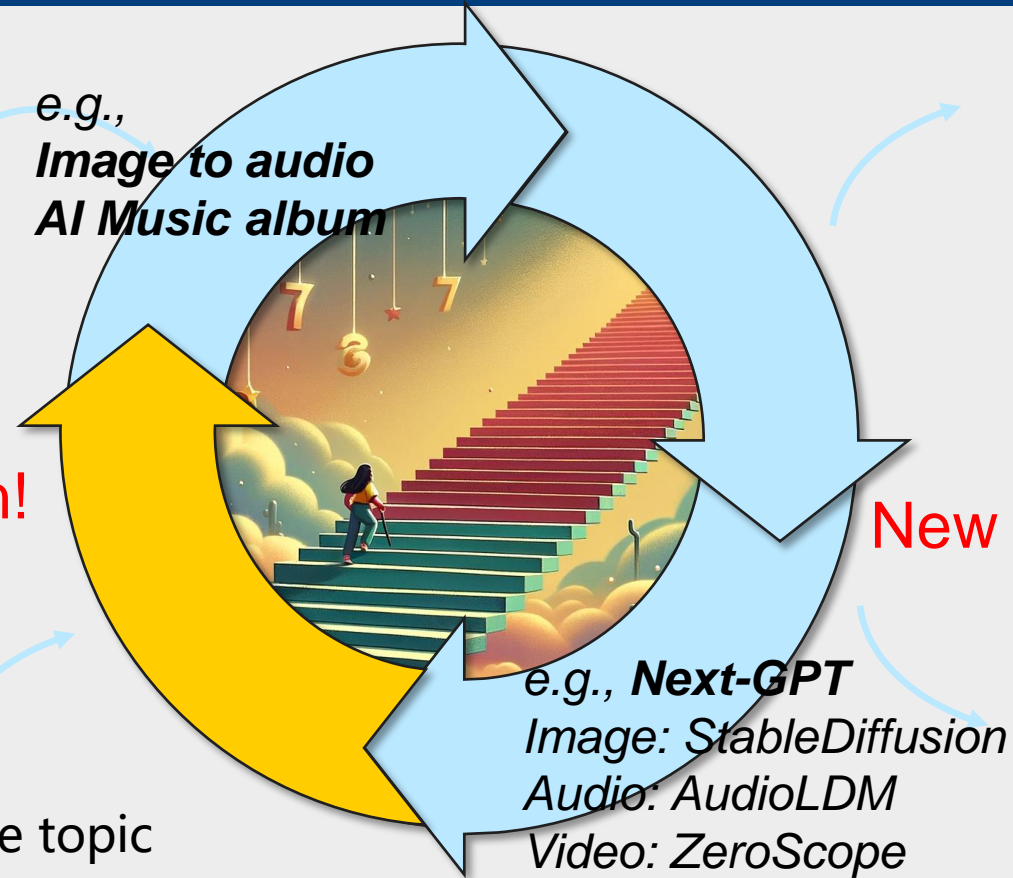
- Nice researcher portfolio
- Surrey become leading on the topic

Be Open!

New research start from here

Research Community

Get motivated and start to work on related fields



On the Shoulder of Giant

Open-sourcing:

- Time commitment
 - **59,622 lines:** changing of code
- User hardware difference
 - MPS, CUDA, CPU, RAM, etc.
- 244 GitHub Issues raised by the community

Publicity:

- How to get attention
- Collaborate properly with the industry or community
- Get funding
 - ICASSP 2024 show-and-tell
 - Remote presentation in Meta, TikTok, MIT, etc.

Actions: What should we be doing / do better?

- » **Communication:** Information & resources are available, but researchers don't know about them
- » **Open Research policy:** There is a lack of clarity within the University community regarding Surrey OR policies and the steps required for compliance
- » **Funding to support OA & data sharing:** A barrier for researchers was funding for OA, monographs, and open data

