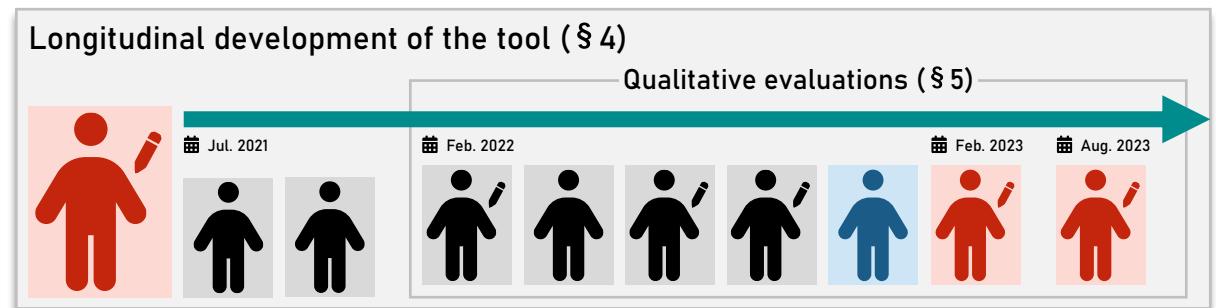
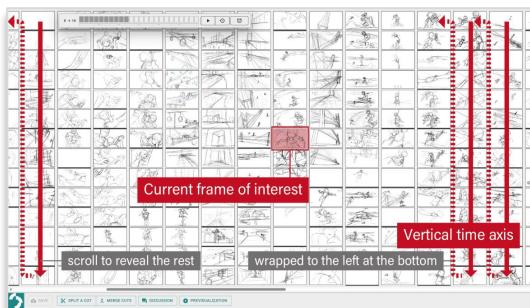




Griffith: A Storyboarding Tool Designed with Japanese Animation Professionals

Jun Kato^{†‡}, Kenta Hara[‡], Nao Hirasawa[‡]

[†]National Institute of Advanced Industrial Science and Technology (AIST) / [‡]Arch Inc.



My research style: a toolsmith researcher

A researcher who builds computational tools for creative people
(creativity support tools, toolkits, programming environments)



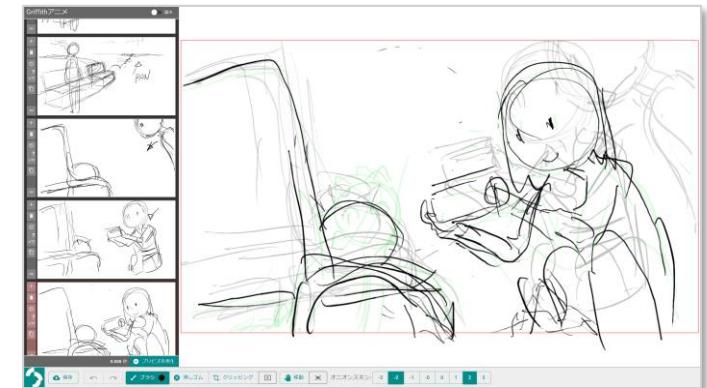
Programmers

DejaVu [UIST '12], Picode [CHI '13 Honorable Mention], TouchDevelop [PLDI '13]



Musicians

TextAlive [CHI '15 Honorable Mention], Lyric App Framework [CHI '23 Honorable Mention]



Anime directors

Griffith [SAS '21 (non-archival), ISID '21 & '22 Best Poster Awards, CHI '24]

More examples at <https://junkato.jp/projects>

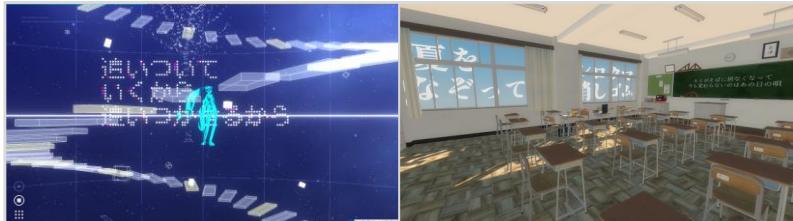


Lyric App Framework: A Web-based Framework for Developing Interactive Lyric-driven Musical Applications

Jun Kato and Masataka Goto

National Institute of Advanced Industrial Science and Technology (AIST)

1. Introduction to lyric apps



2. Lyric App Framework

TextAlive App API
<https://developer.textalive.jp>

```
$ npm install textalive-app-api
import {Player} from "textalive-app-api";
new Player().createFromSongUrl("...");
```

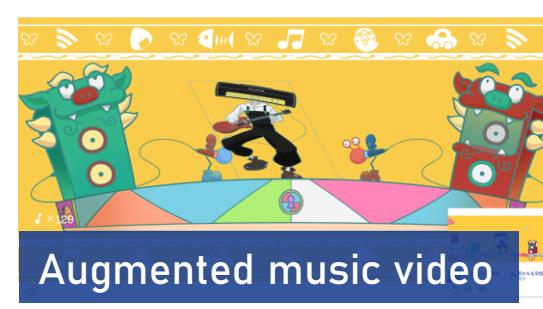
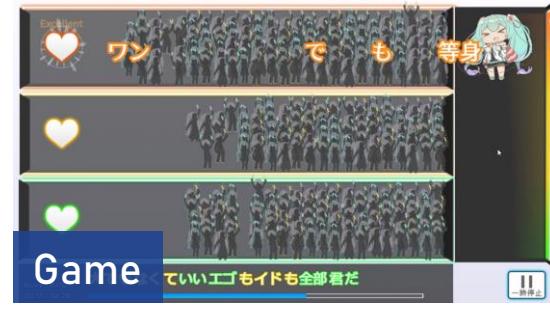
3. Discussions





Design space exploration: 8 lyric app categories

- Paper appendix C has lyric app explanations and notable creative coding libraries used in all 52 applications
- Limitation: no use of experimental web APIs due to contest format (geolocation, accelerometers, Bluetooth, etc.)





This year's contest using Lyric App Framework [CHI '23]



Color the creative
culture through
programming!

HATSUNE MIKU "MAGICAL MIRAI 2024"

PROGRAMMING CONTEST

Hatsune Miku "Magical Mirai 2024" Programming Contest has been announced!

The prize-winning entries will be chosen after a public vote via the MIKUNAVI smartphone app.



My research style: a toolsmith researcher

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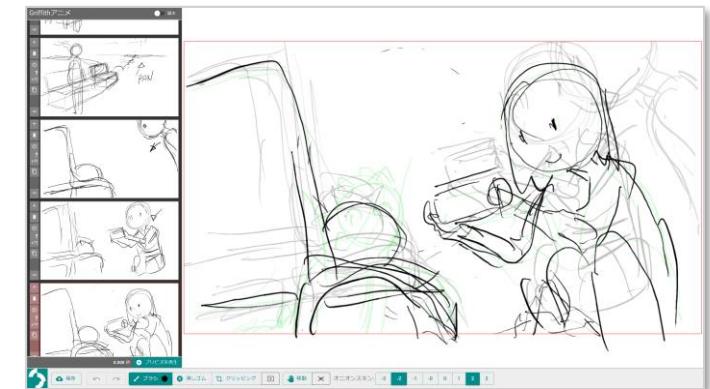
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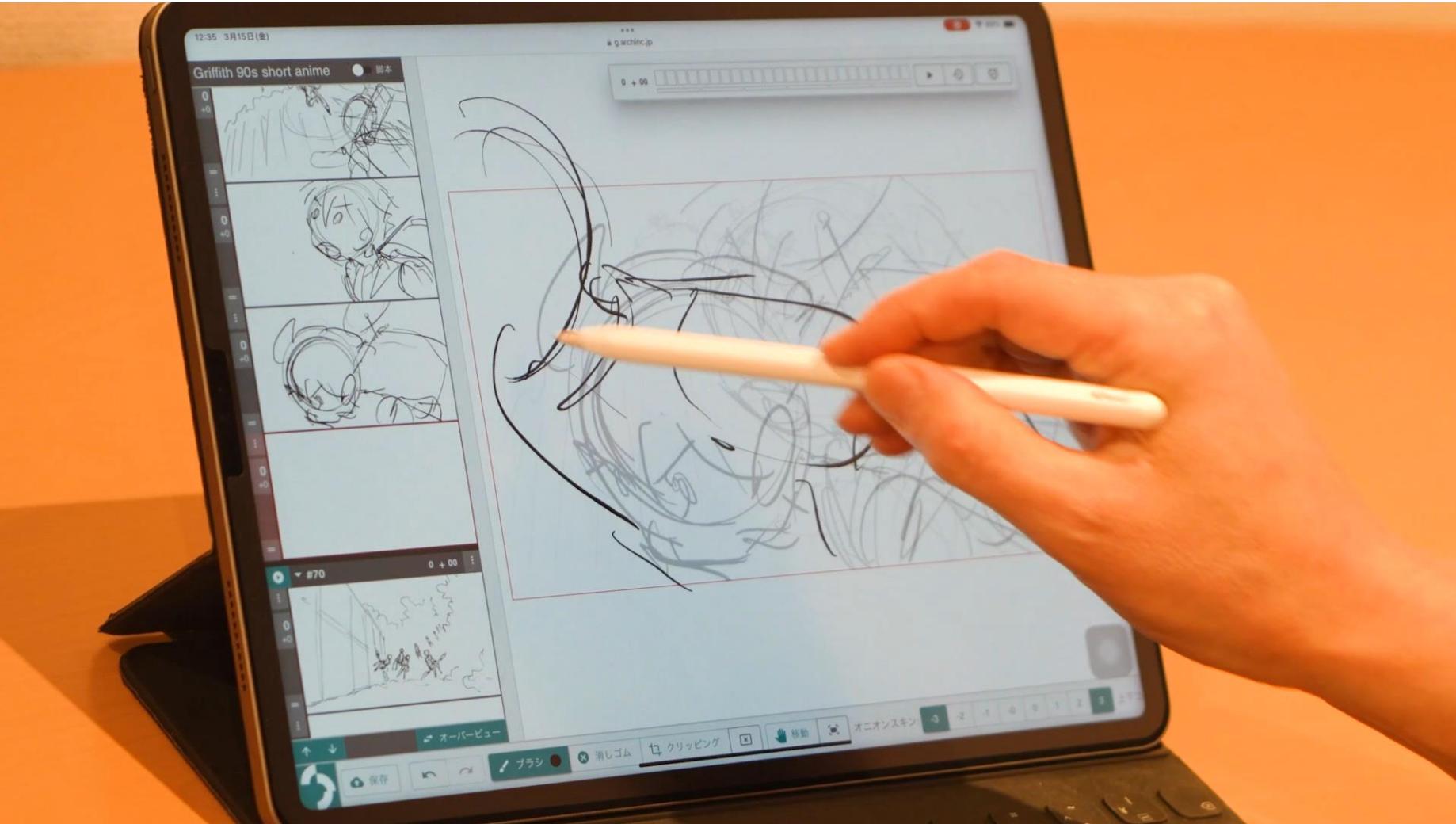
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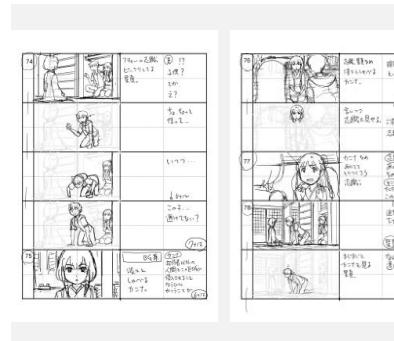
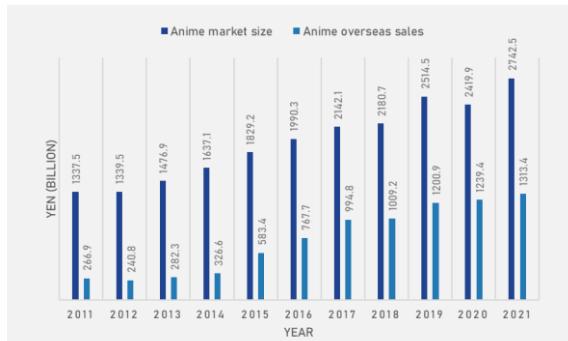


Griffith: a web-based E-conte authoring tool

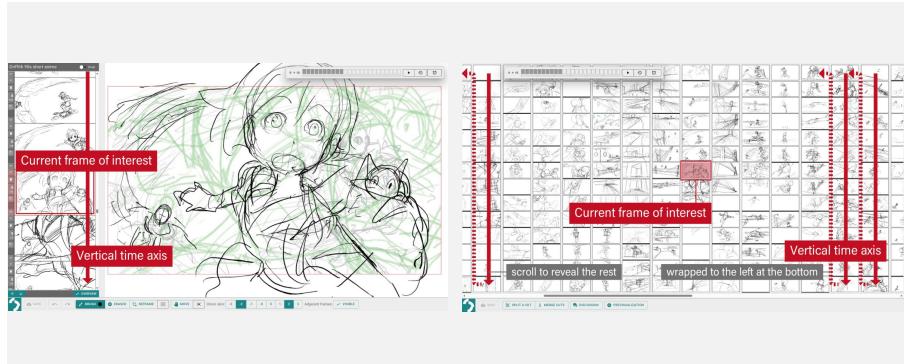




Presentation structure



1 Motivation & Background



3 Griffith

2 Design Principles

Longitudinal development of the tool (§ 4)

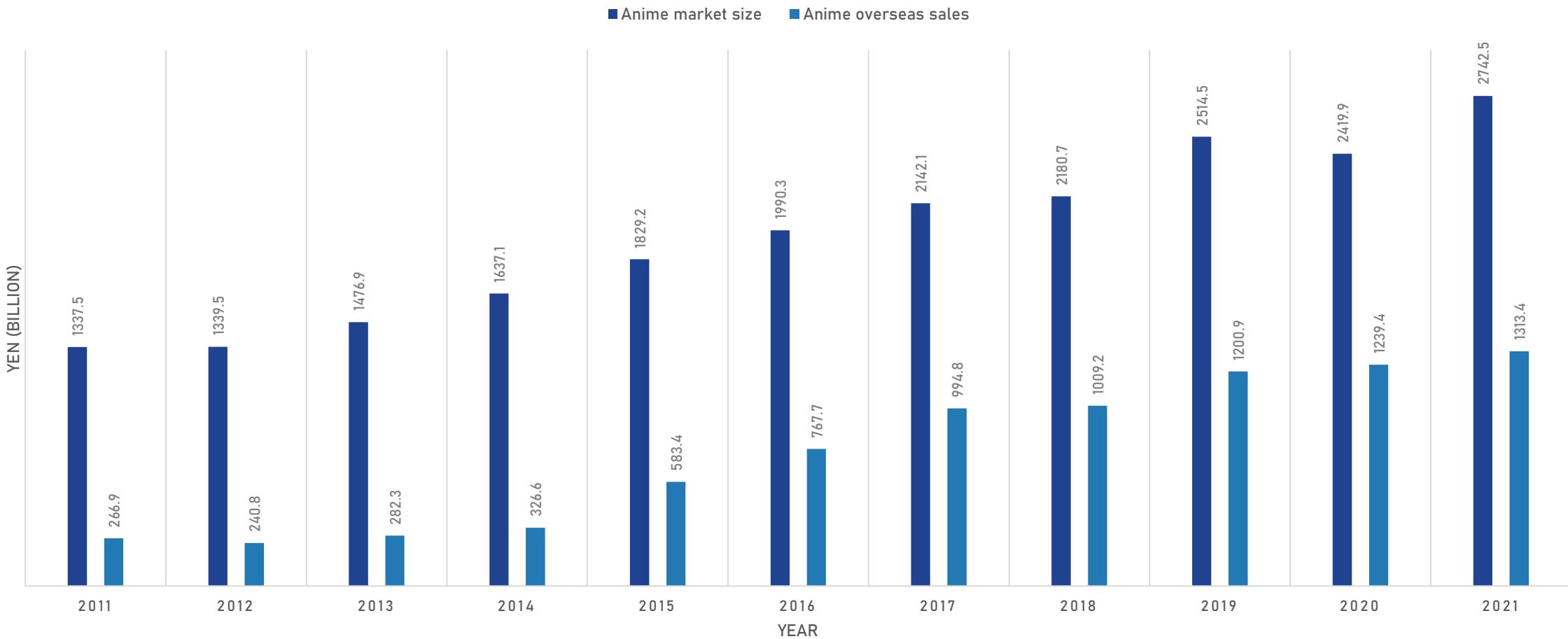
Interview study (§ 2) Jul. 2021
■ 2019 ■ 2021

Qualitative evaluations (§ 5) Feb. 2022 Feb. 2023 Aug. 2023

4 Longitudinal Study with Professionals



Anime is becoming more popular, but its production process is not



[Data source] The Association of Japanese Animation. 2023. Anime Industry Report 2022 Summary. <https://aja.gr.jp/english/japan-anime-data>

Special Interest Group on Creativity and Cultures in Computing (SIGCCC)

SIG meeting at CHI 2023

Onsite venue: Room Y09, Congress Center Hamburg (CCH) / Online venue: Zoom
16:35-18:00, Mon, Apr 24 (CEST; conference time zone)

Organizers:



Jun Kato
AIST



Jonas Frich
Aarhus University



Zhicong Lu
City University of Hong Kong



Jennifer Jacobs
University of California, Santa Barbara



Kumiyo Nakakoji
Future University Hakodate



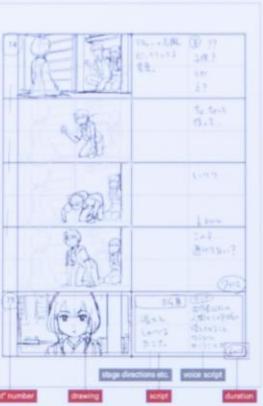
Celine Latulipe
University of Manitoba

<http://chci.pages.dev/chi2023>

Study on creative activities in non-WEIRD cultures



洛天依 (Luo Tianyi)



ARCH | Research



References:

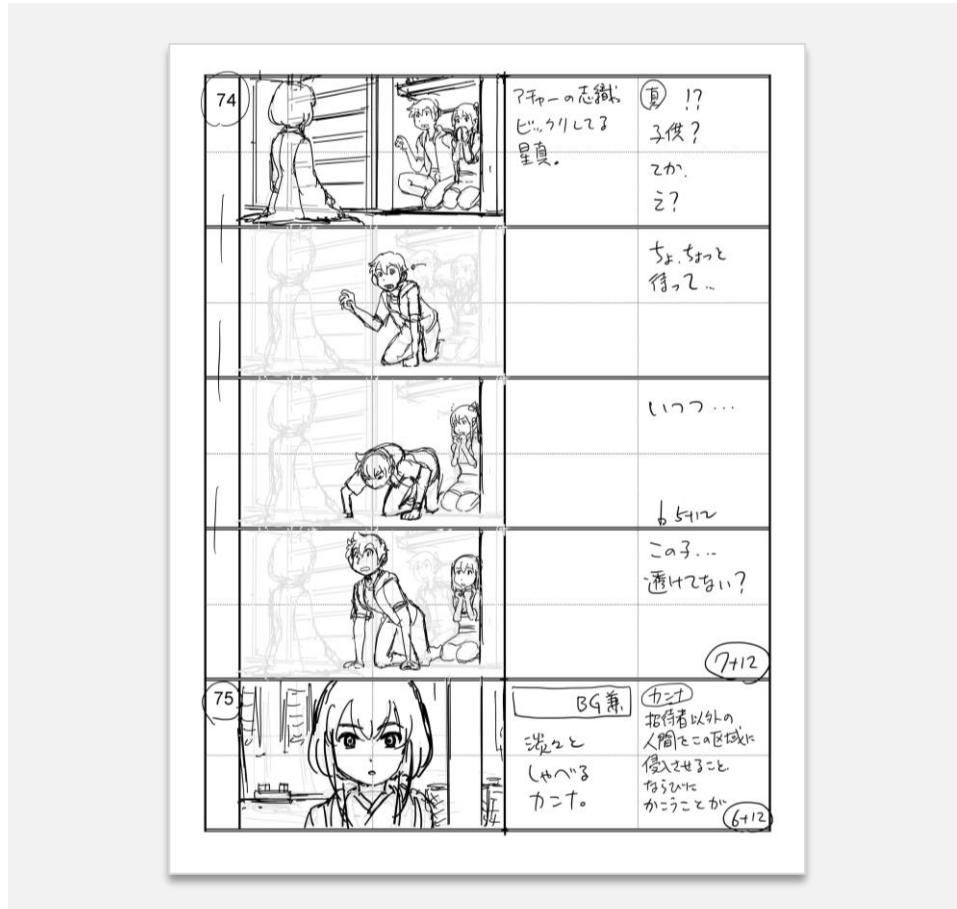
- Zhicong Lu, Chenxinran Shen, Jiannan Li, Hong Shen, and Daniel Wigdor. More Kawaii than a Real-Person Live Streamer: Understanding How the Otaku Community Engages with and Perceives Virtual YouTubers [ACM CHI 2021].
Jun Kato, Ryotaro Mihara, Nao Hirasawa. Past, Present, and Future of Storyboarding in Japanese Animation [SAS 2021 (non-archival talk)].

12





Hand-drawn sketches at the heart of animation production



[Image courtesy of MIXI, Inc.]

An example of e-conte page, Starlight Promises

"The storyboarding process was developed at Walt Disney Studios in the 1930s and the art form continues in our studio today."



[Image source] Story Pad

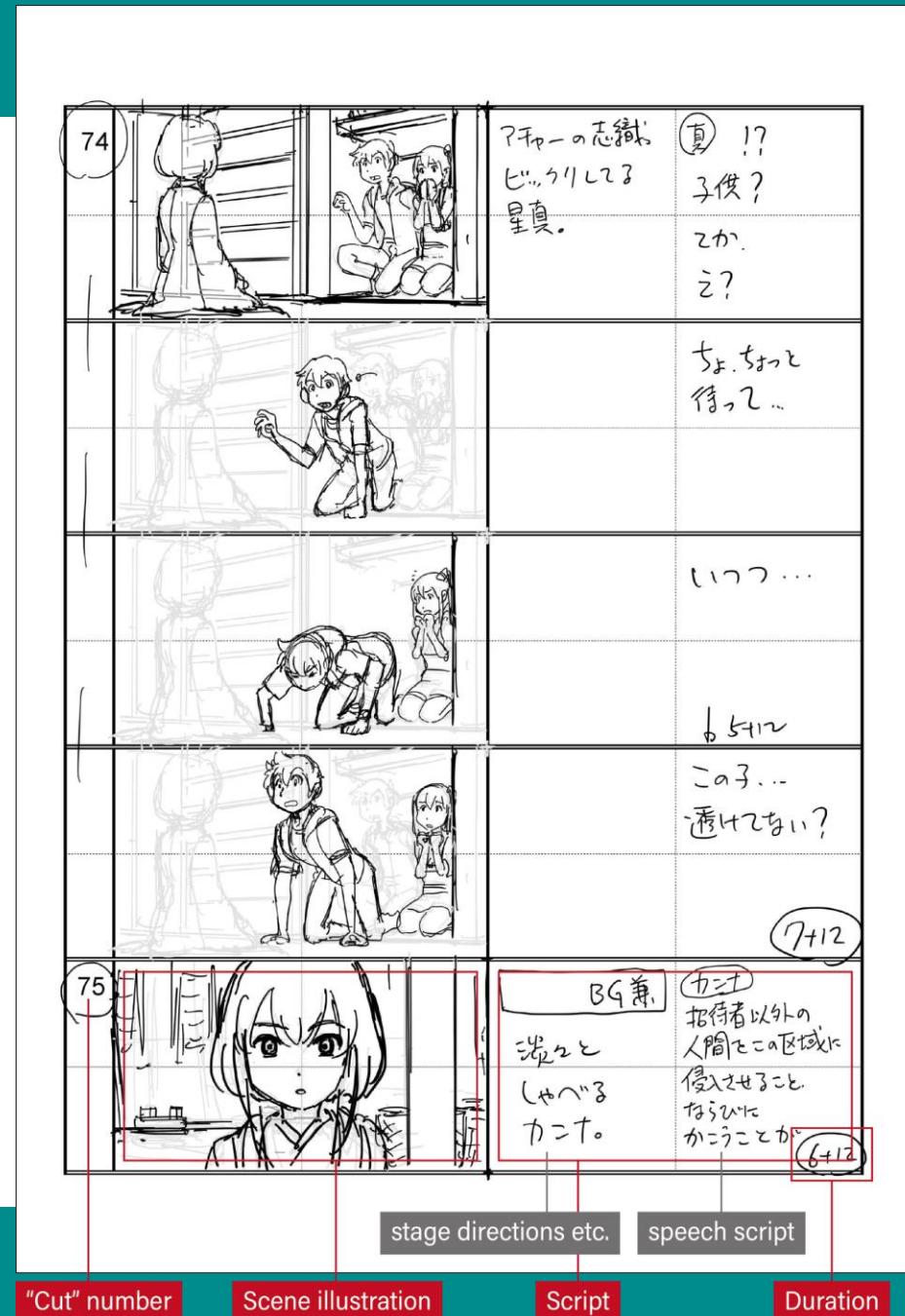
<https://disneyanimation.com/technology/story-pad>



What is E-conte?

- “E” (illustration)
“conte” (continuity)
- “Storyboard” in English
- A4-size paper is divided into 4-6 rows, each of which consists of a “cut” number, a scene illustration, script, and duration
- The vertical timeline contributes to continuity, as it allows easy comparison of left-right balance between frames

[Image courtesy of MIXI, Inc.] An example e-conte page from Starlight Promises

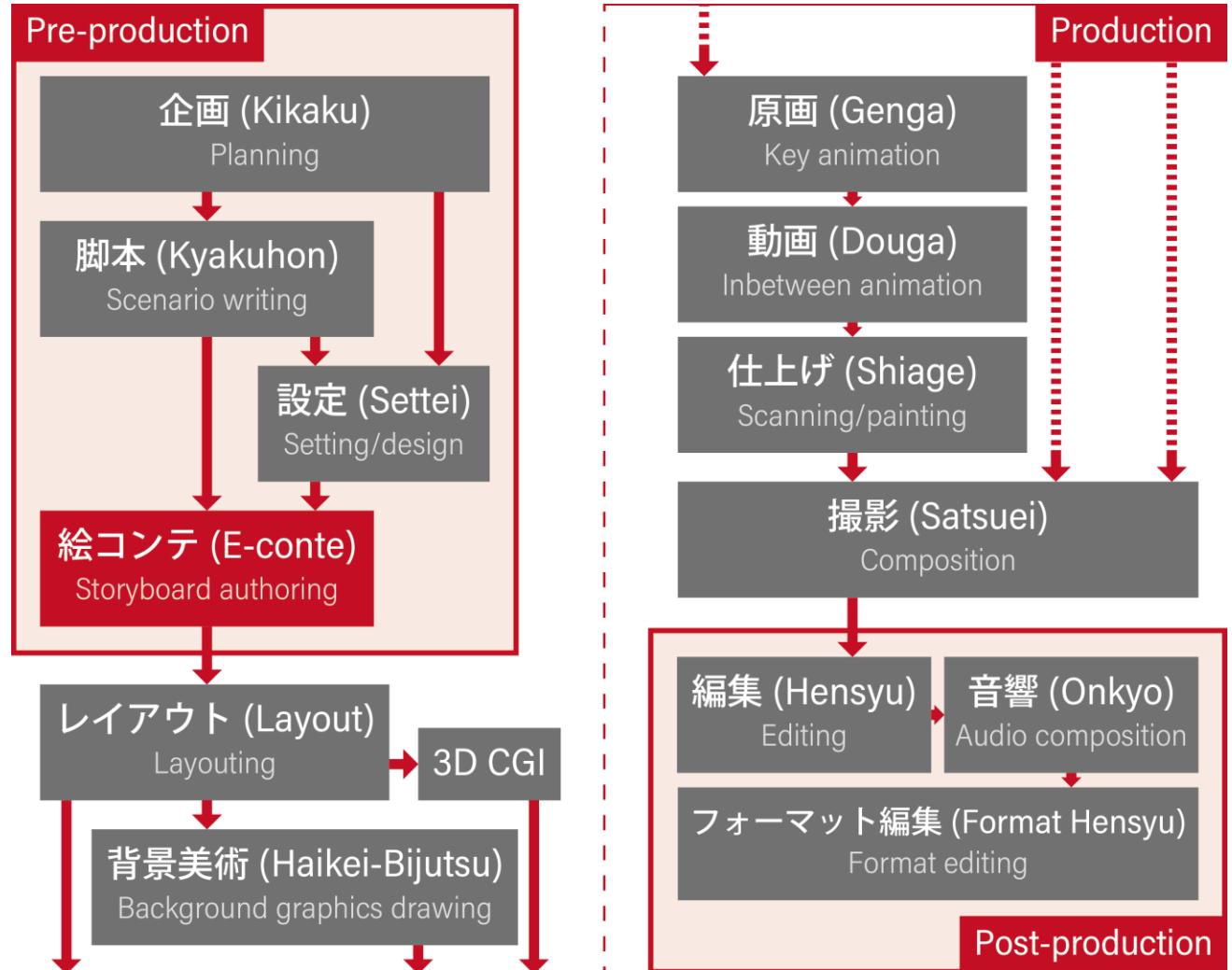




Role of E-conte in anime production pipeline

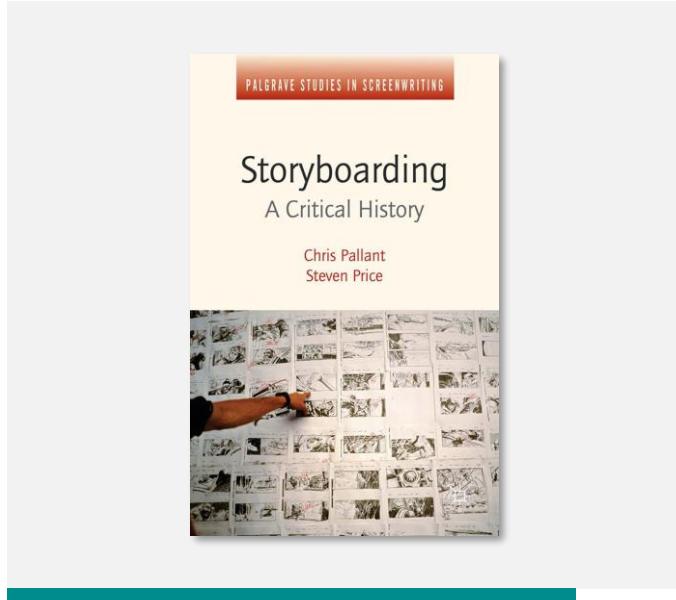
- Pre-production
≈ ten people
- Production and post-production
≥ a hundred people

E-conte =
a blueprint of the
anime film





Comparing and contrasting anime and Western storyboarding

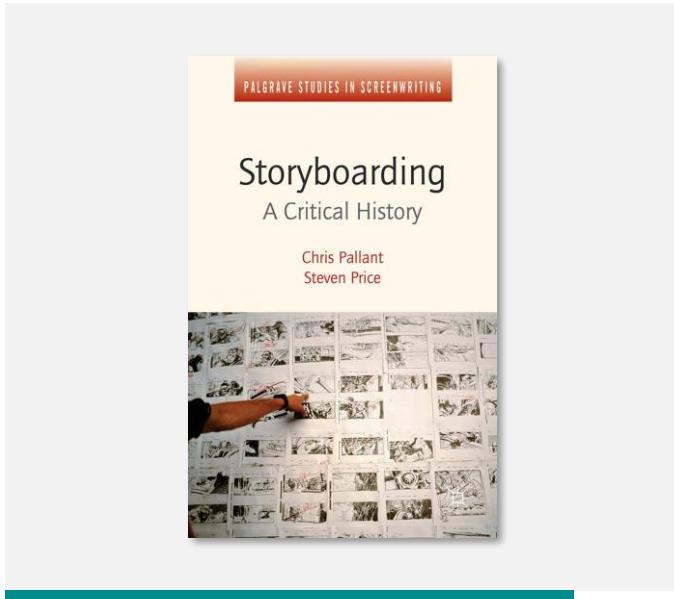


Common characteristics

- Each element in every frame of an animation is drawn intentionally
- Careful planning in pre-production is important



Comparing and contrasting anime and Western storyboarding



Differences

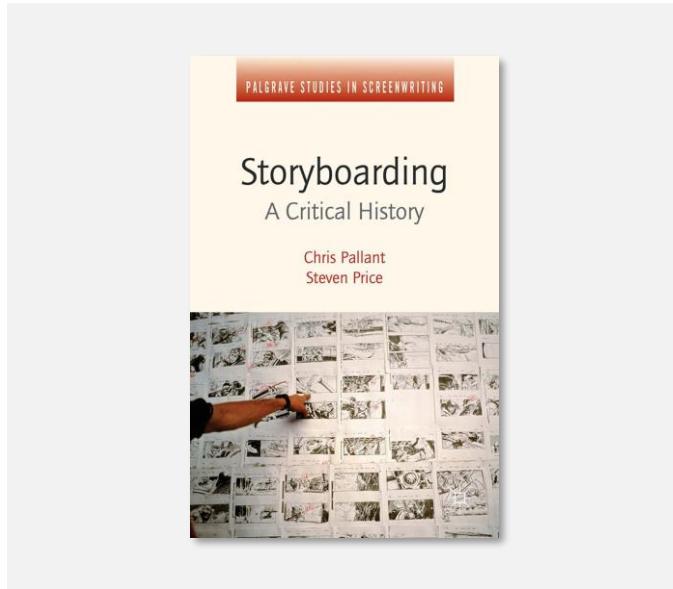
[image courtesy of Chris Pallant] "Storyboarding: A Critical History", p.50



Figure 2.2 A promotional still, c.1933, showing a staged story planning session for *The Grasshopper and the Ants* (1934), featuring Webb Smith seated far left and Walt Disney in the centre. Image provided courtesy of The Walt Disney Company.



Comparing and contrasting anime and Western storyboarding



Differences

An example usage shot of
Griffith authoring E-conte

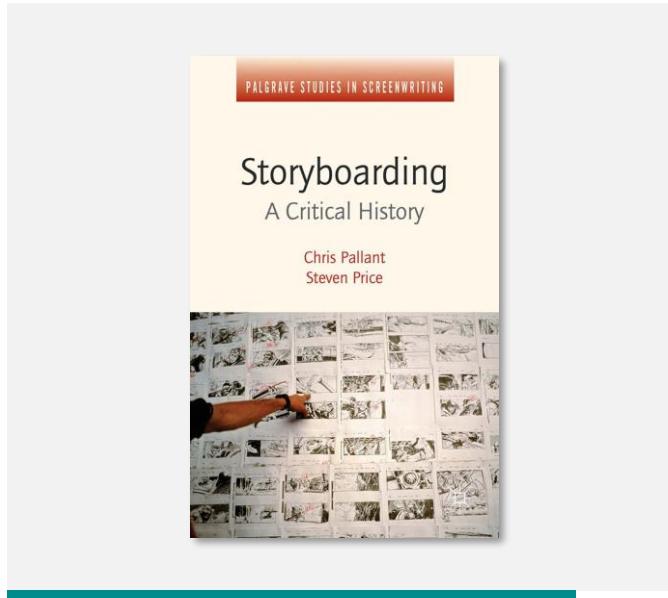


Common characteristics

- Each element in every frame of an animation is drawn intentionally
- Careful planning in pre-production is important



Comparing and contrasting anime and Western storyboard



Common characteristics

- Each element in every frame of an animation is drawn intentionally
- Careful planning in pre-production is important

Differences

- **Storyboard**, a term derived from a wall-mounted “story” + “board”, emphasizes collaborative and open discussions
- **E-conté authoring** is a personal process that produces a precise, directional document in a standardized format

[Upper: image courtesy of Chris Pallant] “Storyboarding: A Critical History”, p.50
[Lower] An example usage shot of Griffith authoring an E-conté frame



Figure 2.2 A promotional still, c.1933, showing a staged story planning session for *The Grasshopper and the Ants* (1934), featuring Webb Smith seated far left and Walt Disney in the centre. Image provided courtesy of The Walt Disney Company.





E-conte authoring is NOT just about a pen and paper

- Authoring E-conte requires a precise and rich imagination
- Auxiliary tools are needed, such as a special stopwatch!



[Image source] 1/24 Byou Kei Stopwatch Jikki Seisakusha Murata Kazuya Shi Heno Interview
https://www.janica.jp/products/24k_stopwatch/interview.html

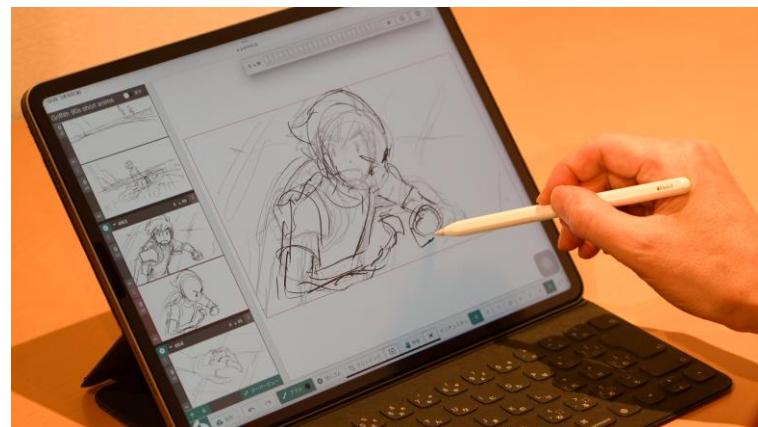
Storyboarding demands
a creativity support “environment”



Design principles of Griffith

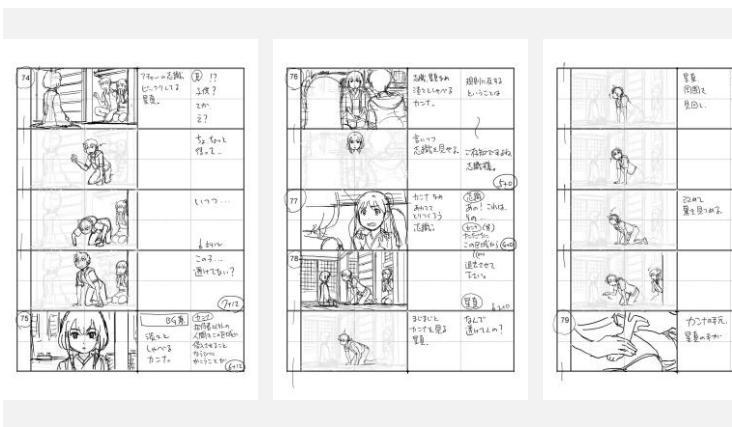
DP 1

A system that could be used in casual and private settings



DP 2

User interfaces that reflect continuous nature of storytelling



DP 3

Auxiliary features that comprise a creativity support environment



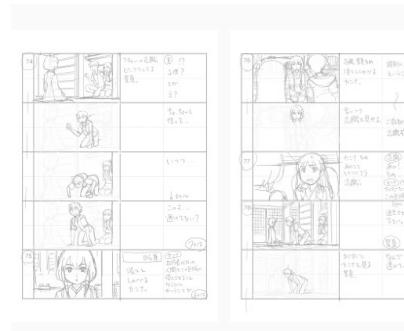
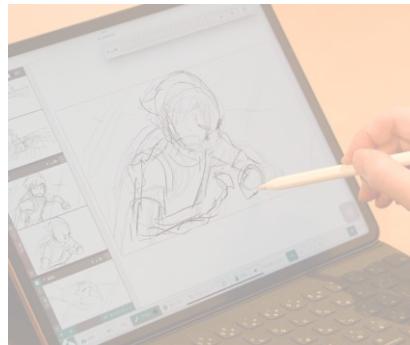
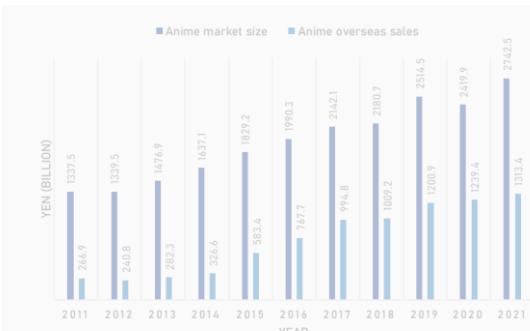
[Left] An example usage shot of Griffith authoring an E-conte frame

[Middle: image courtesy of MIXI, Inc.] E-conte pages, Starlight Promises

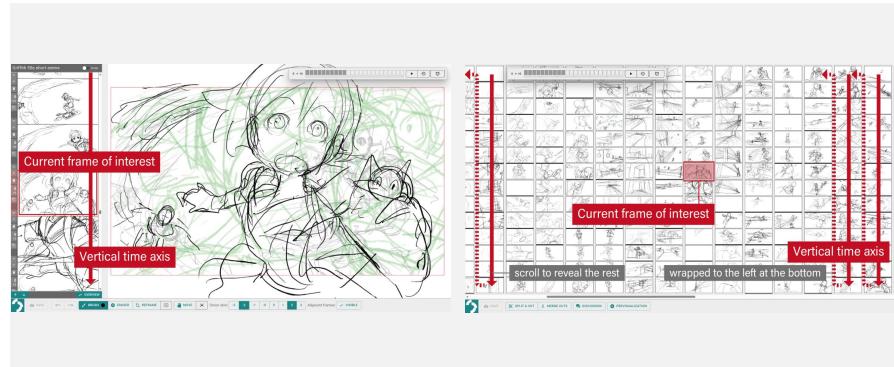
[Right: image source] 1/24 Byou Kei Stopwatch Jikki Seisakusha Murata Kazuya Shi Heno Interview https://www.janica.jp/products/24k_stopwatch/interview.html



Presentation structure



1 Motivation & Background



Longitudinal development of the tool (§ 4)

Interview study (§ 2) ■ Jul. 2021

Qualitative evaluations (§ 5) ■ Feb. 2022 ■ Feb. 2023 ■ Aug. 2023

3 Griffith

4 Longitudinal Study with Professionals



DP 1

A web-based system for casual use



x5

“Ideas can come at any time, and instant access to E-conte is critical to not forgetting them” – the director

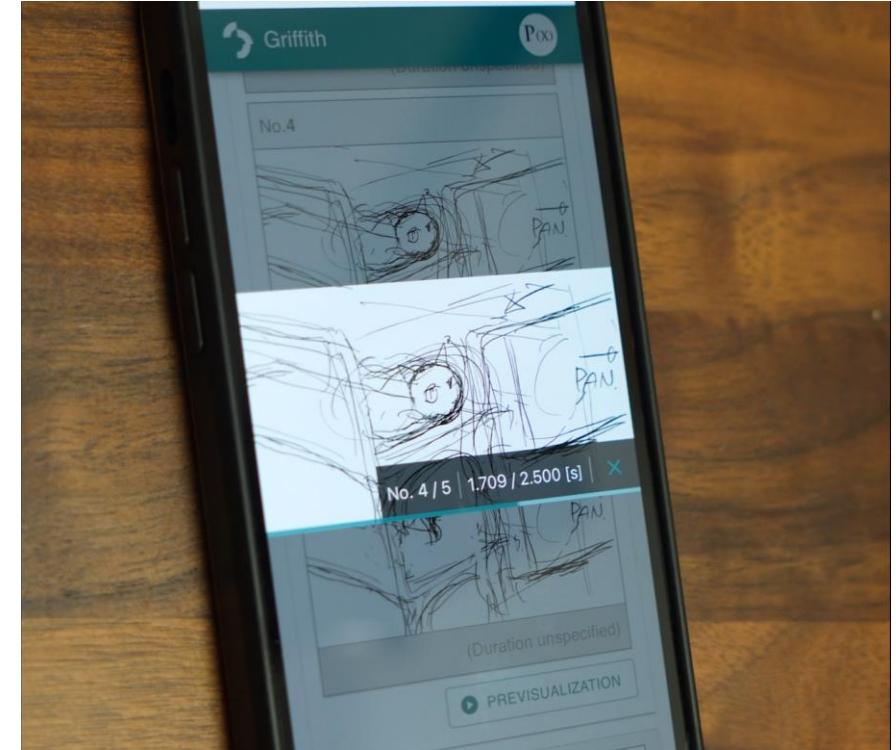


DP 1

A web-based system for casual use



“Ideas can come at any time, and instant access to E-conte is critical to not forgetting them” – the director



The content can also be viewed by others on their smartphones

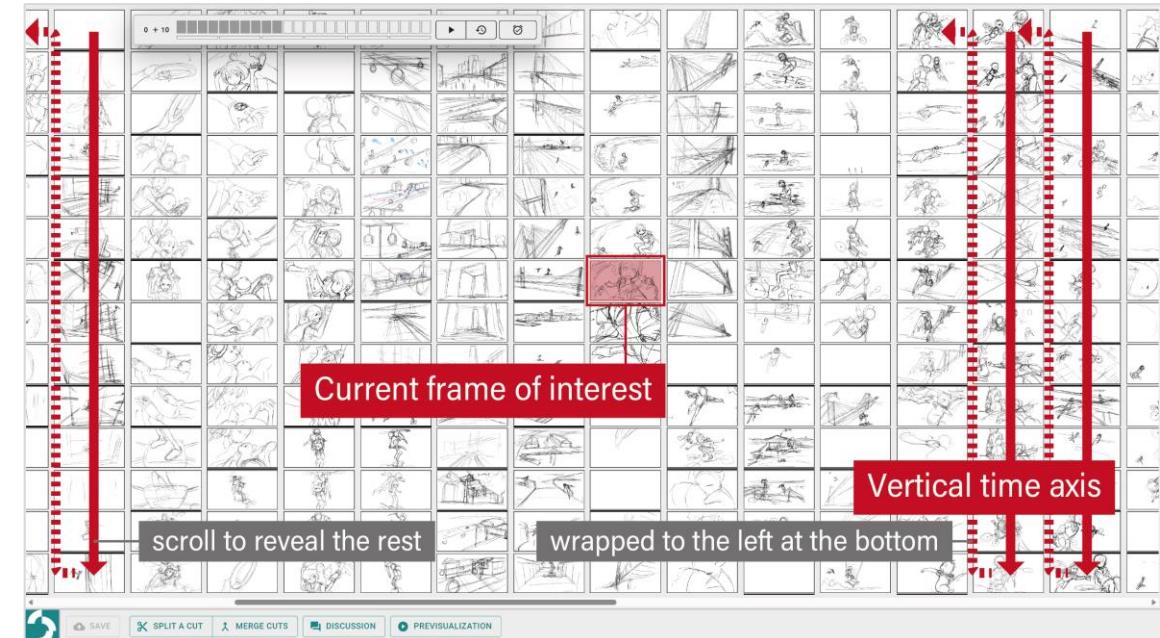


DP 2

User interfaces for E-conte authoring



Main view



Overview interface



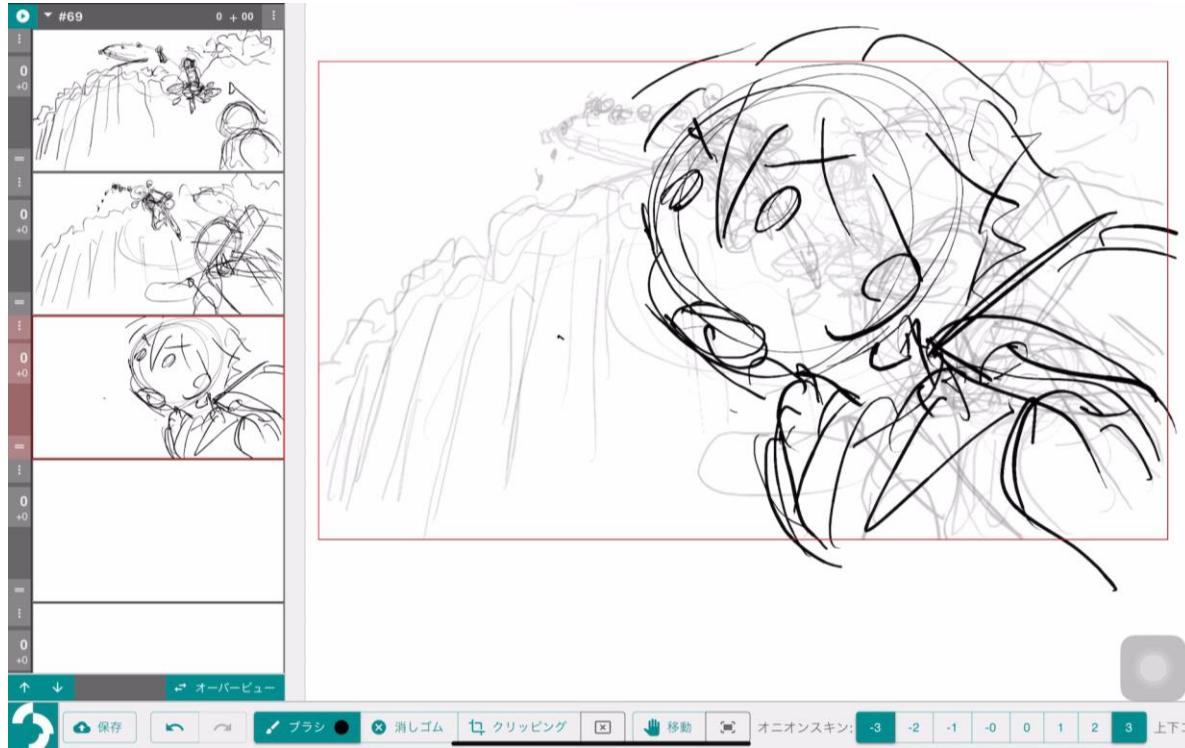
Main view for sketching ideas



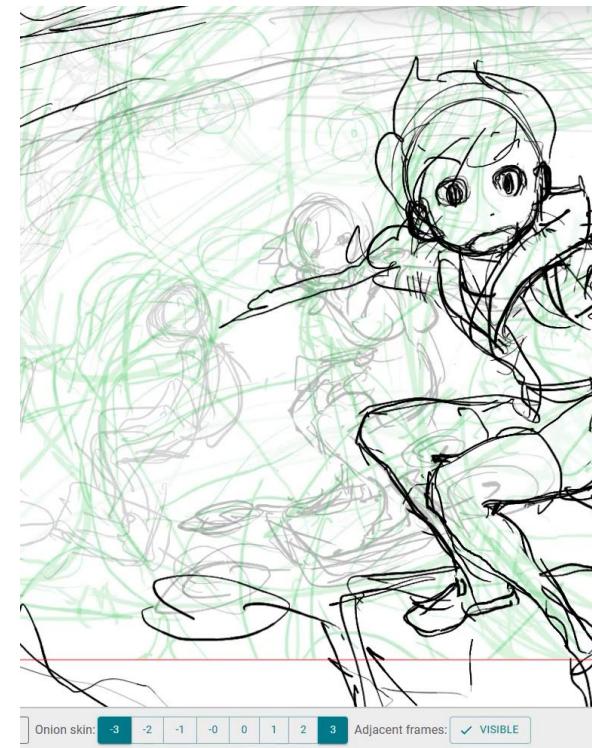
Minimalistic canvas with native support for multiple frames, unlike software for artistic illustrations



Main view for sketching ideas



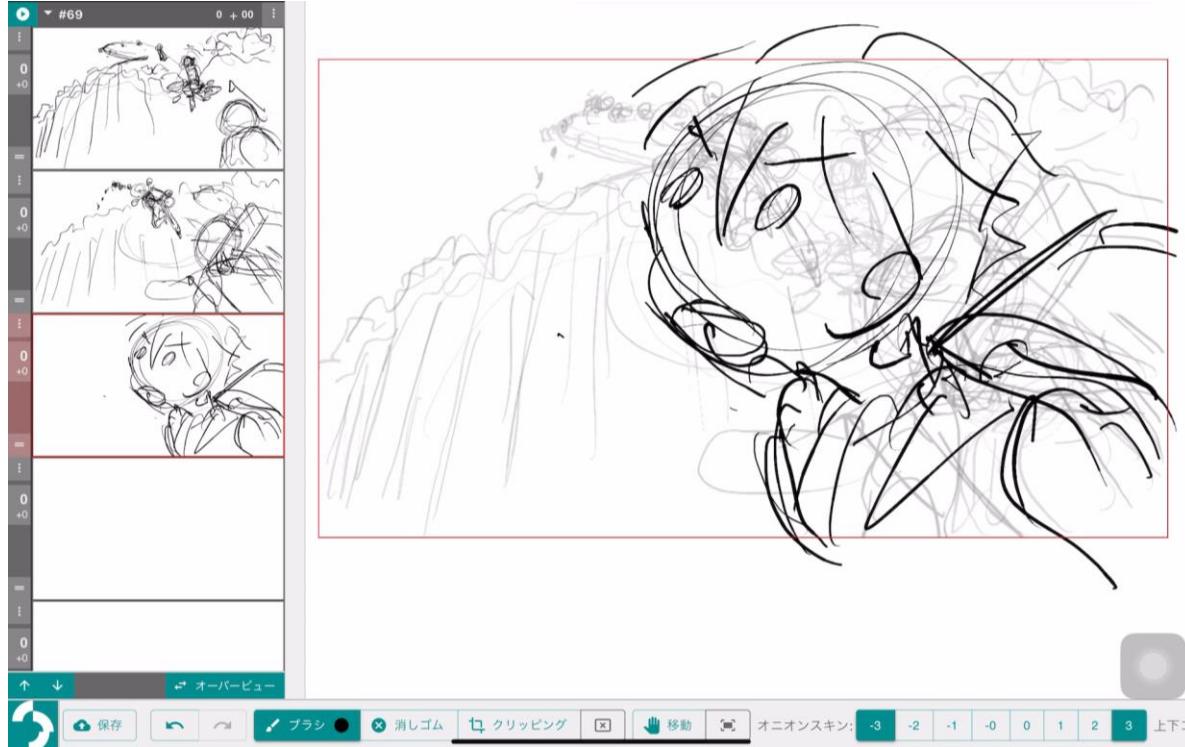
Minimalistic canvas with native support for multiple frames, unlike software for artistic illustrations



Onion skin and in-canvas frames for “continuity”



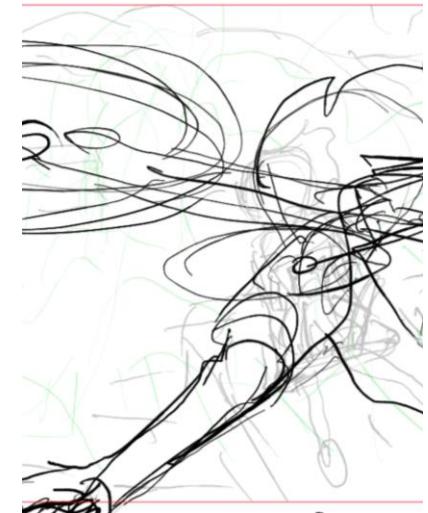
Main view for sketching ideas



Minimalistic canvas with native support for multiple frames, unlike software for artistic illustrations



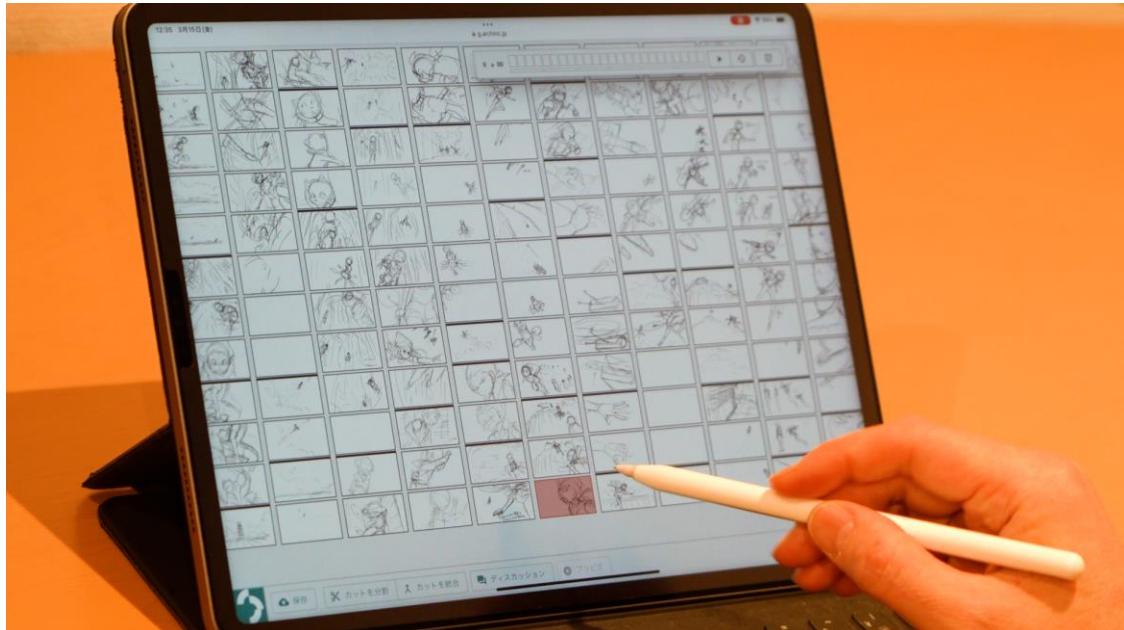
Onion skin and in-canvas frames for “continuity”



Scribbles and notes in “Margins”



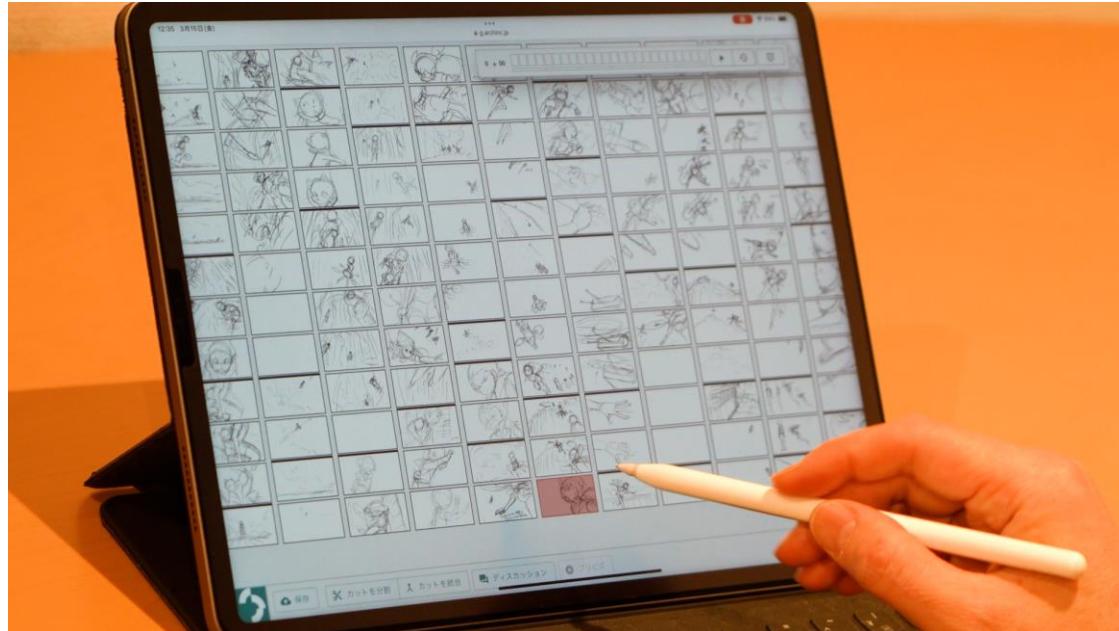
Overview for view-shifts and “cut” editing



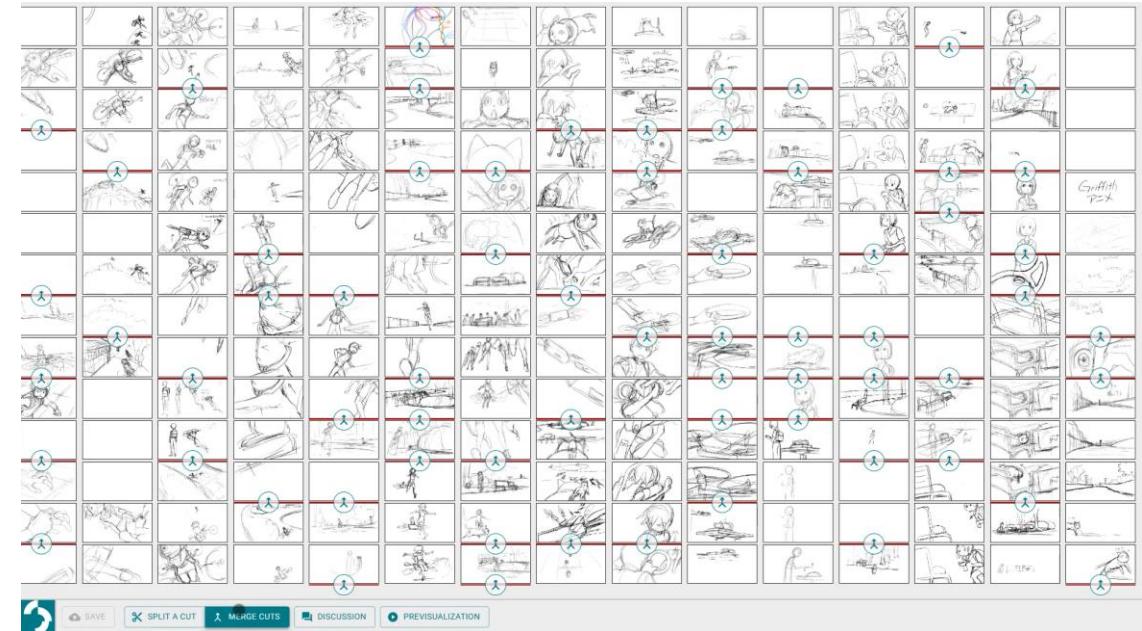
Switching between the main and overview interfaces allows for a holistic understanding



Overview for view-shifts and “cut” editing



Switching between the main and overview interfaces allows for a holistic understanding

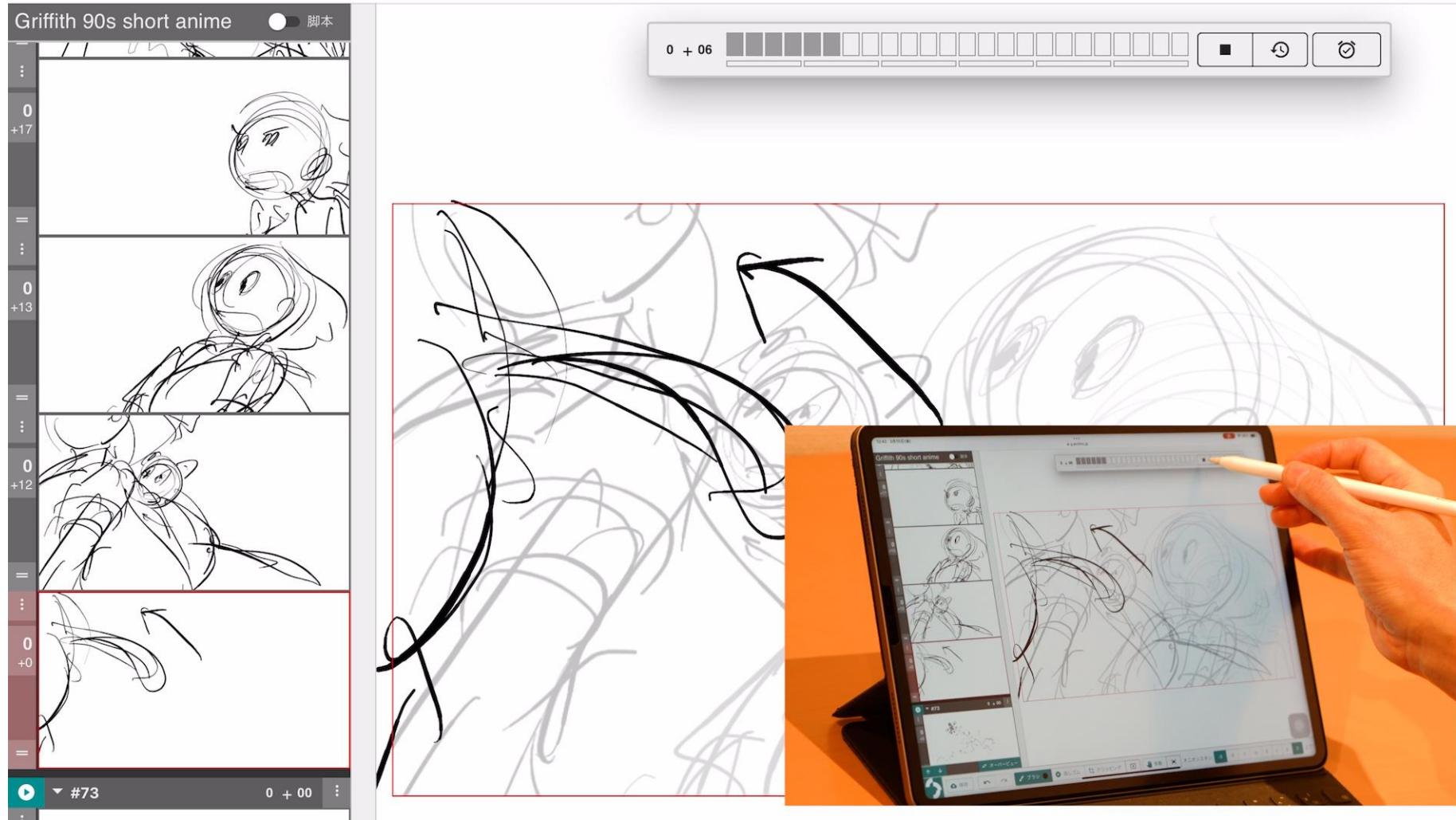


The overview interface is also a good place to implement inter-frame operations



DP 3

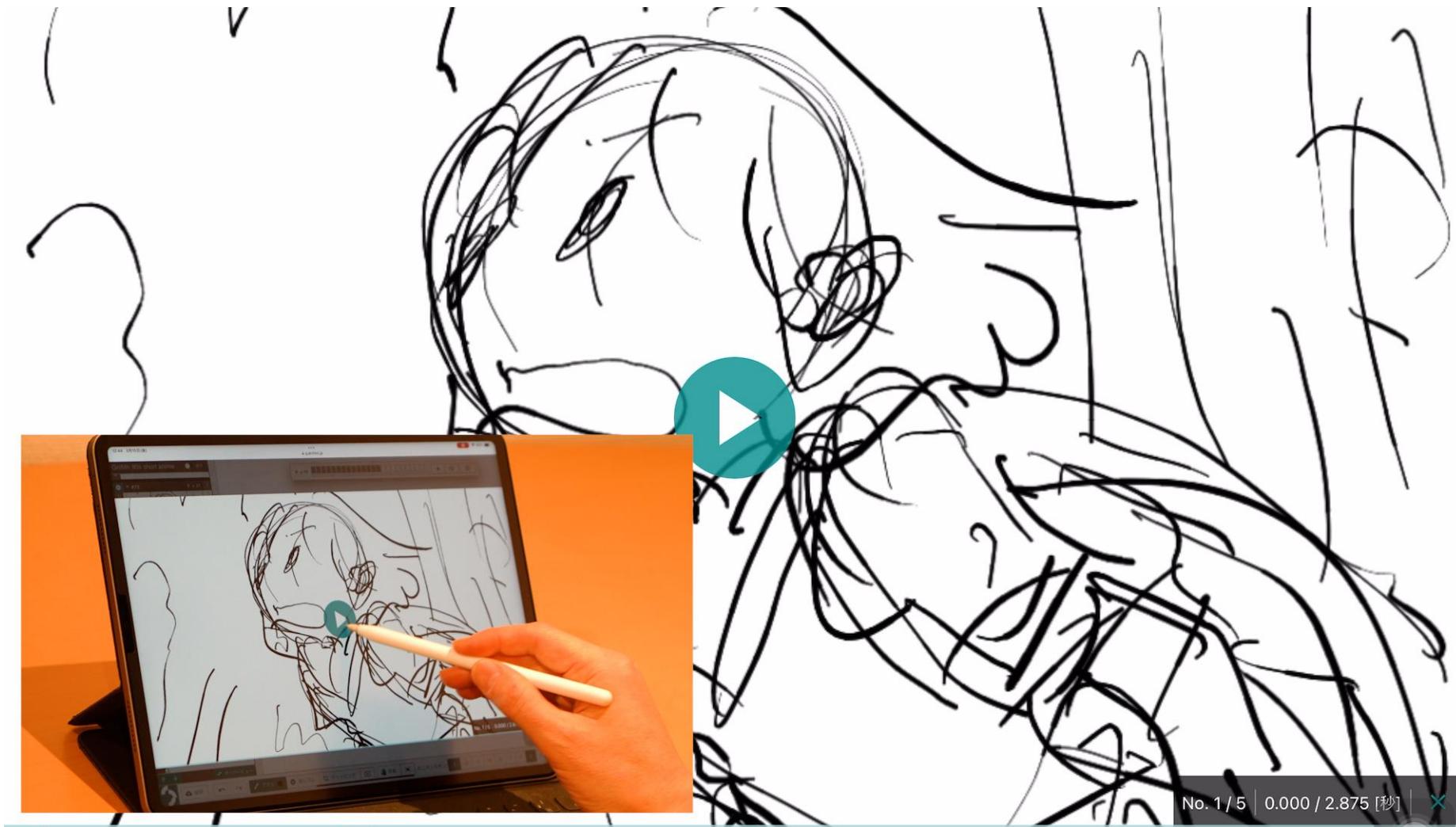
Auxiliary features to support E-conte authoring





DP 3

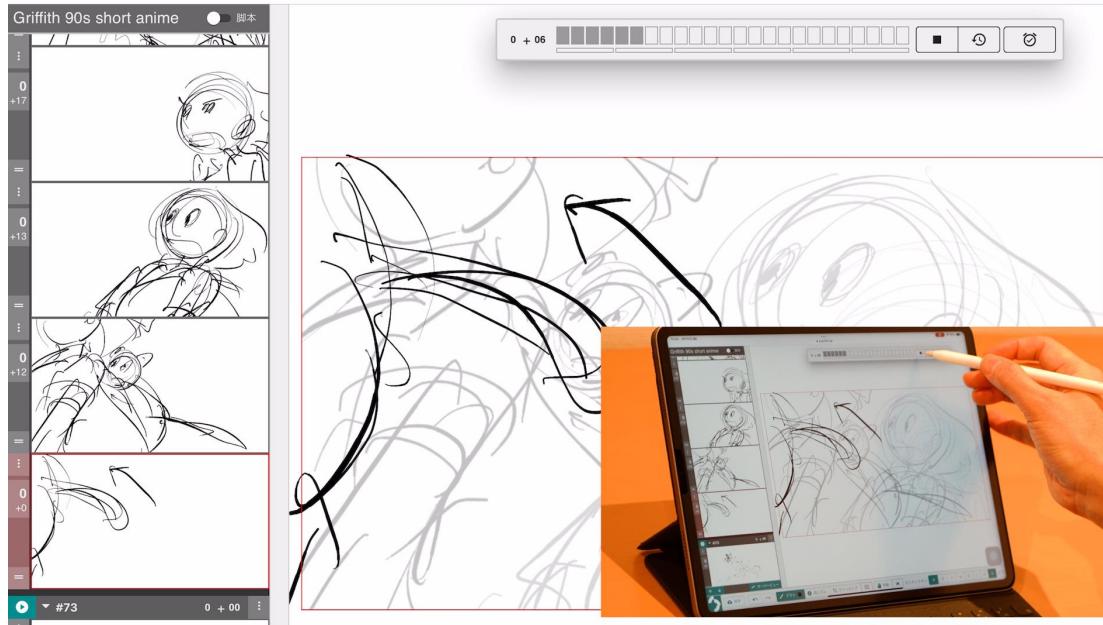
Auxiliary features to support E-conte authoring



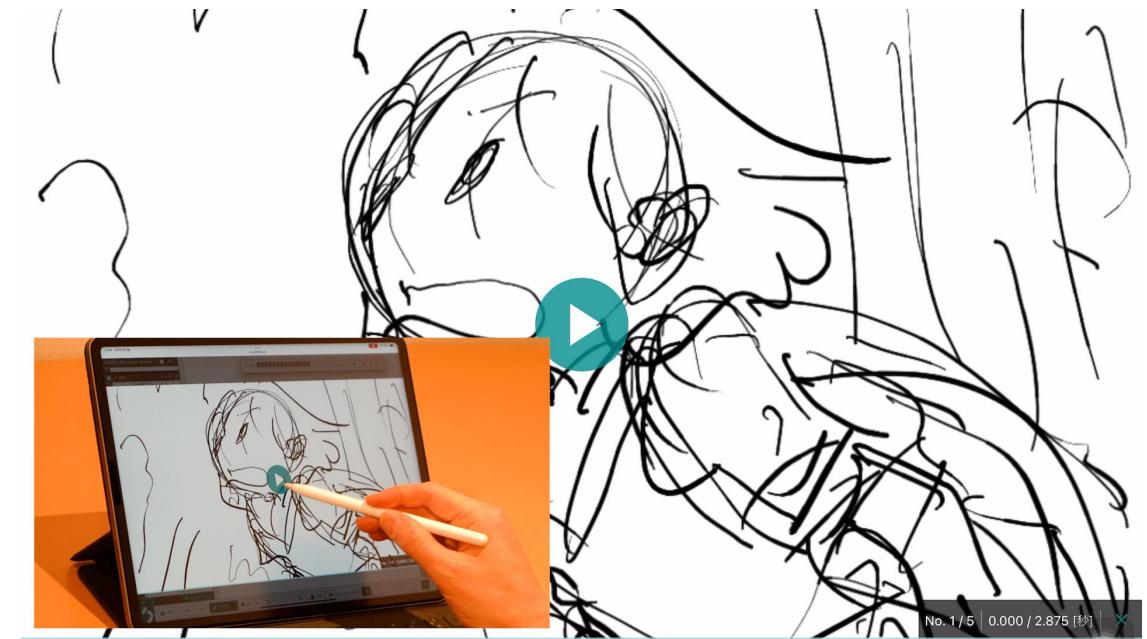


DP 3

Auxiliary features to support E-conte authoring



Stopwatch

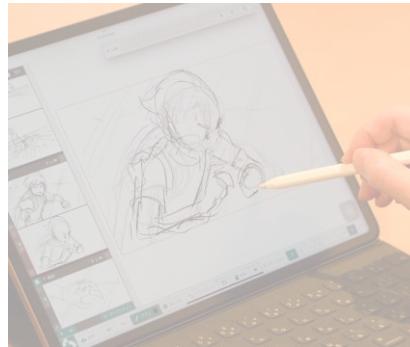
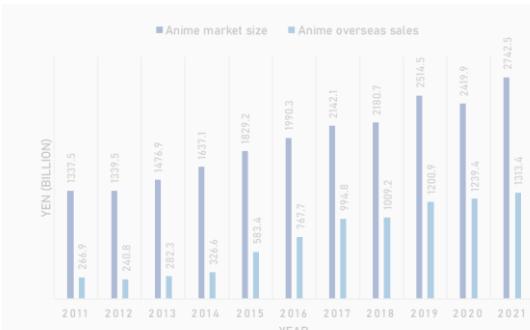


Previsualization

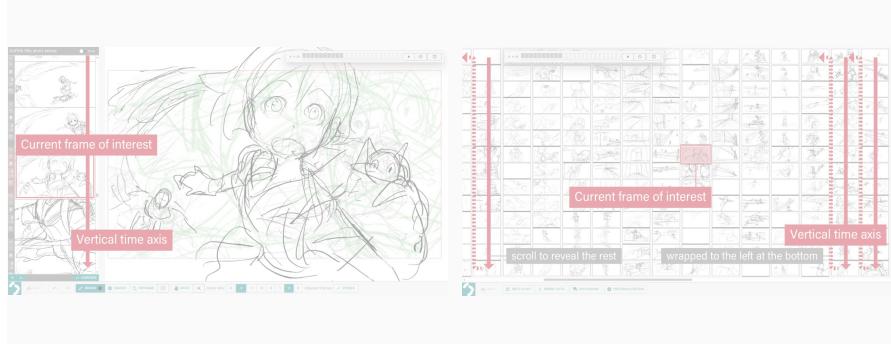
...and more in the paper!



Presentation structure



1 Motivation & Background



3 Griffith

2 Design Principles

Longitudinal development of the tool (§ 4)

Interview study (§ 2) ■ 2019



Qualitative evaluations (§ 5) ■ Feb. 2022 ■ Feb. 2023 ■ Aug. 2023



4 Longitudinal Study with Professionals



Discussion: vertical timeline

We found that vertical timeline has three advantages:

- Smooth infinite scrolling without hand occlusion
- The landscape aspect ratio dominant in anime films making horizontal timeline scrolling longer per frame
- Easy comparison of left-right balance between multiple frames



Main view + vertical timeline



Main view + horizontal timeline



Discussion: vertical timeline

We found that vertical timeline has three advantages:

- Smooth infinite scrolling without hand occlusion
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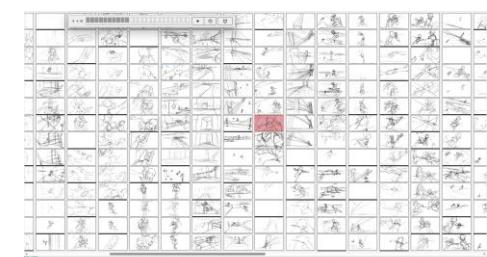
However, the advantage becomes a bit nuanced in the overview interface, where “line breaks” occur



Main view + vertical timeline



Main view + horizontal timeline

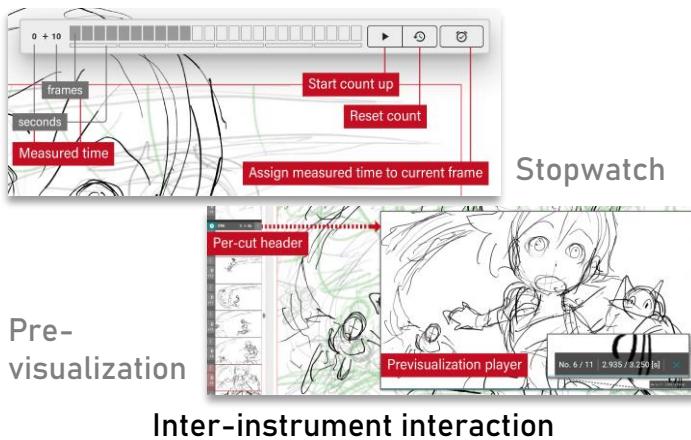


Overview + vertical timeline



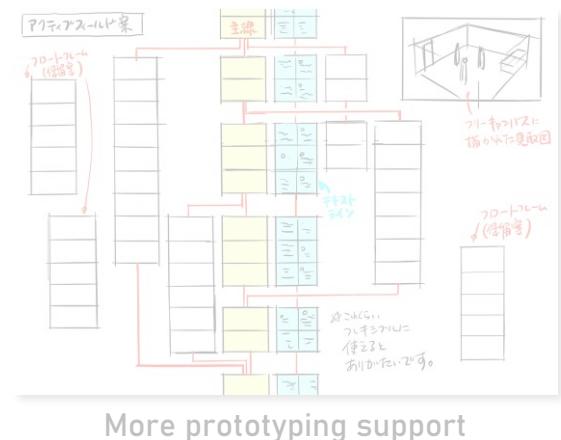
Discussions

- Discrete yet integrated “instruments” cf. instrumental interaction
- Socio-technical tool design for collaborative creativity
- Future work
 - Active support for prototyping storylines
 - Leveraging a wider variety of structured information in E-conte
 - Acquiring a more diverse landscape of storyboard tools



Griffith STORBOARDS
Top page ▾ List of storyboards Griffith 90s short anime
Testing discussion
Author: Pw: Jun Kata · Created at: 2024/03/15 (Fri) 19:57:50 · Updated at: 2024/03/15 (Fri) 19:57:50
INDIVIDUAL COMMENTS OVERALL COMMENTS
c132 · Created at: 2023/02/04 (Sat) 14:39:37 · Updated at: 2024/03/15 (Fri) 18:56:10
Create a discussion thread
Testing discussion

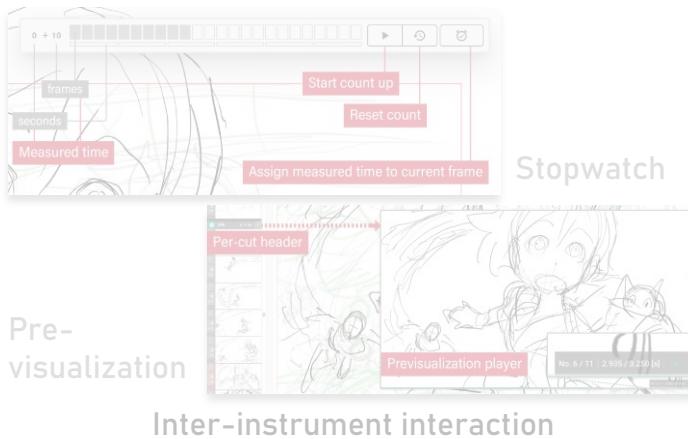
Discussion board with privacy and convenience in mind



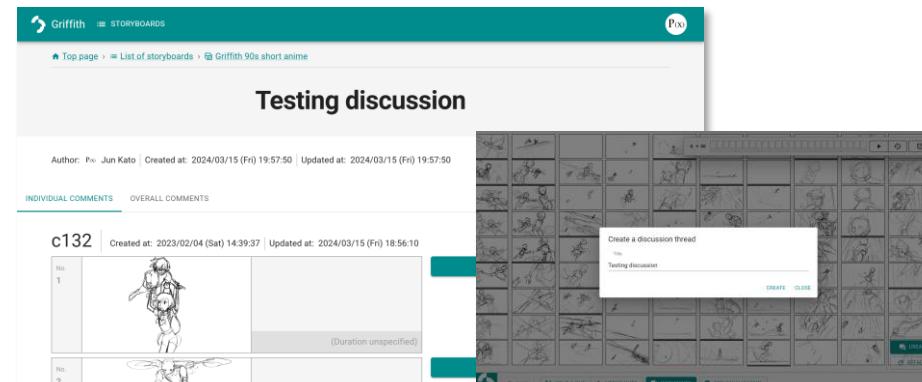


Discussions

- Discrete yet integrated “instruments” cf. instrumental interaction
 - **Socio-technical tool design for collaborative creativity**
 - Future work
 - Active support for prototyping storylines
 - Leveraging a wider variety of structured information in E-conte
 - Acquiring a more diverse landscape of storyboard tools



Inter-instrument interaction



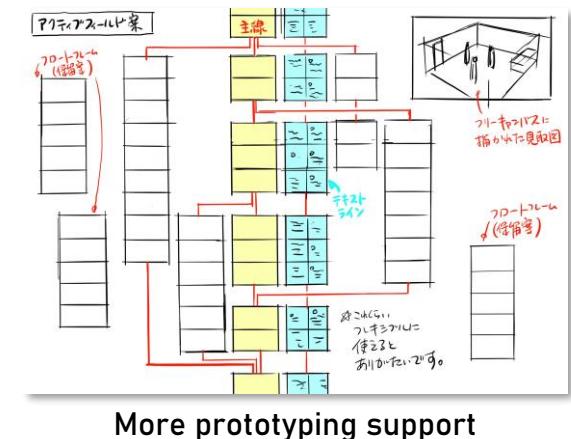
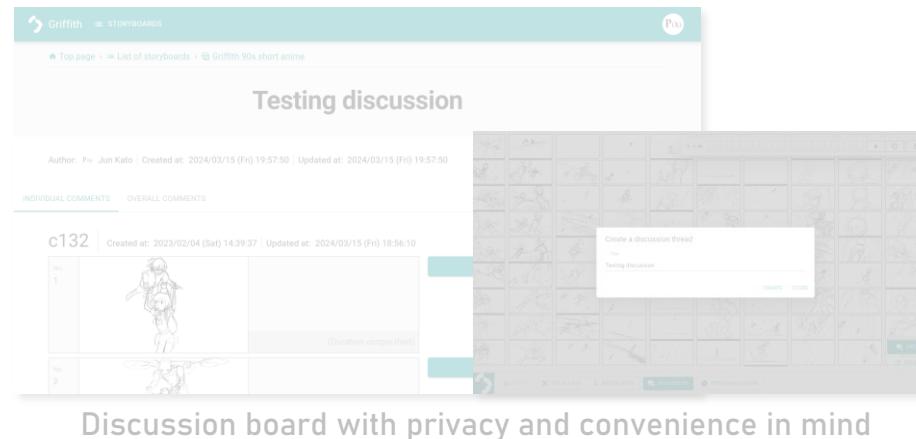
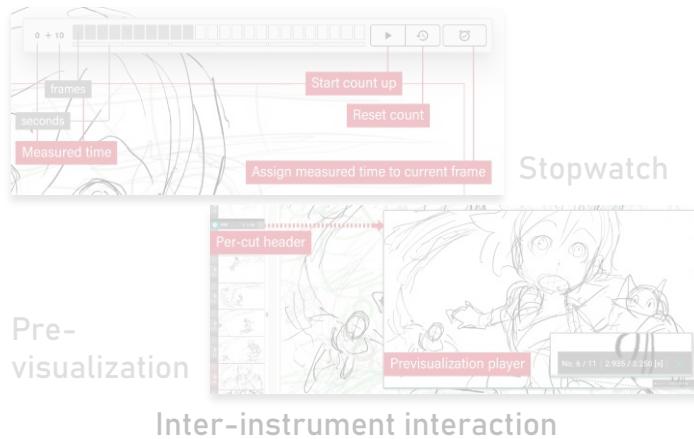
Discussion board with privacy and convenience in mind

More prototyping support



Discussions

- Discrete yet integrated “instruments” cf. instrumental interaction
- Socio-technical tool design for collaborative creativity
- Future work
 - Active support for prototyping storylines
 - Leveraging a wider variety of structured information in E-conte
 - Acquiring a more diverse landscape of storyboard tools





Griffith: A Storyboarding Tool Designed with Japanese Animation Professionals

Jun Kato^{†‡}, Kenta Hara[‡], Nao Hirasawa[‡]

[†]National Institute of Advanced Industrial Science and Technology (AIST) / [‡]Arch Inc.

<https://research.archinc.jp/en>

dev@archinc.jp

