Ayatori Residency Reflections

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1. Project Background

'Ayatori' is the Japanese name for the game 'cats-cradle' - the weaving and exchange of infinite design and shapes from a single thread involving two or more people. The Ayatori project originally began in lockdown in 2020 through audiovisual exchanges between saxophonist and composer Ed Jones[1] and photographer Yuriko Takagi[2]. Over the next 18 months, the project developed through further exchanges and facilitation from En Rapport's[3] Keith Michael and Asako Taguchi (En Rapport 2024).

Seven fixed audiovisual pieces were created through this remote exchange process. From this, an interest in using AI technology to explore audiovisual links emerged, and Matthew Yee-King[4] from Goldsmiths department of Computing was brought in as a fifth member.

In 2023, funding was secured for a two-week residency at The Academy of Music and Theatre Arts (AMATA) at Falmouth University[5] to further develop existing and create new material. The residency took place between 10th and 21st July of that year.

This article will focus on the residency from the perspective of the author, a member of AMATA academic staff who was involved in securing internal University research funding and was a contributing audiovisual artist during the residency.

2. Residency Aims

2.1 Summary Aim

To develop the existing audiovisual work and create new material through:
- real-time collaboration in physical space working towards live performance
- an expanded pool of collaborators and incorporation of artificial intelligence, real-time audio and visual technologies and dance

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[1] https://www.edjonesjazz.co.uk/
[2] https://yurikotakagi.com/
[3] https://www.en-rapport.org/
[4] https://en.wikipedia.org/wiki/Matthew_Yee-King
[5] https://www.falmouth.ac.uk/departments/academy-of-music-theatre-arts

3. Method

3.1 Practice-Research Methodology

The residency used practice-research methodology (Nelson 2013). As the starting point was in the work itself, research questions emerged during the course of the 2-week residency and are summarised as follows:

Overall question:
How might a series of fixed audiovisual works developed in lockdown be developed for live performance through a two-week residency? Aspects of this question included:

- How will the work be impacted by an in-person, time-limited process?
- How might the work be developed through artificial intelligence?
- How might the work be developed through real-time audio and visual technologies?
- How might the work be developed through the inclusion of additional artforms and personnel?

Practitioners kept journals to facilitate reflective practice, regular production meetings were held and a documentary film was produced that captured a cross-section of insights during and immediately following the project.

Figure 1: Filmed reflective discussion/Q&A with the project team following the final performance in AMATA. L-R: Keith Michael, Si Waite, Yuriko Takagi, Edgar Jones, Matthew Yee-King, Asako Taguchi.

3.2 Location

The residency took place in AMATA's Studio A over 2 weeks in July, with additional 'breakout' spaces booked as required. There were performances at the end of each week - the first at The Poly in Falmouth and the second in the main residency space.

3.3 Personnel

The artists and creatives working on the project are detailed in the table below:

Artist	Organisation	Role
Ed Jones	En Rapport	Composer / Musician
Yuriko Takagi	En Rapport	Photographer
Keith Michael	En Rapport	Producer / Musician
Matthew Yee-King	En Rapport	AI specialist / Musician
Asako Taguchi	En Rapport	Producer
Si Waite	Falmouth University	Visuals / Musician / Researcher
Owen Smith	Freelance Artist	Dance & Choreography
Katrina Brown	Falmouth University	Dance & Choreography
Tom Ingate	Falmouth University	Documentary Film
David White	Falmouth University	Photography

The above personnel were also supported by student interns, assistants and AMATA technical staff.

4. Field Review

This section is organised with respect to the four sub-questions identified in the previous section.

4.1 Remote vs In-Person Collaboration

Following the global COVID-19 pandemic, artists were able to return to in-person collaborative working in purpose-built spaces following sustained isolation and lockdown. Cai et at (2021) highlight the importance that physical space, time, proper mindsets, and social connection all have on creative music-making practices.

4.2 Artificial Intelligence and Audiovisual Work

AI is being used extensively in contemporary audiovisual installation and performance practice. Techniques include the analysis of audiovisual material and data to create latent spaces that can be exploited by generative algorithms (AA School of Architecture 2020). McCormack et al (2020) highlight several issues in current creative AI research. These include a tendency to focus on outcome rather than process, reusability of techniques and lack of transparency. The authors also advocate the importance of human and machine creative partners being able to learn about the other through repeated encounters.

4.3 Real-time Technologies

Gibson (2022) reviews a range of technologies that support live audiovisual practices including Ableton Live, Max, Touch Designer and MIDI controllers.

4.4 Interdisciplinarity

Ikoniadou (2014) discusses the convergence of multiple artforms into new, multisensory experiences where boundaries between disciplines dissolve and more fluid networks emerge. d'Escriván (2012) discusses how either visuals or sound/music may form the dominant component of a performance. Gibson (2022) documents how the emergence of live visuals performance approaches and practices such as VJ-ing that may serve to preserve an audiovisual whole.

5. Summary of the Residency: Personal Perspective

5.1 Week 1 Development

The first week began with introductions among the team members present, presentation of the background to the project, plans for the residency and a screening of the existing audiovisual works at scale for the first time. From En Rapport, Ed, Yuriko and Keith were there on Monday, with Matthew joining us later in the week. Owen and Katrina (as well as student dancers) would not be joining up with the project until Week 2.

Following this introduction, compositional ideas, technologies and techniques were discussed on a more informal basis. As the music intern had dropped out of the project, my role needed to adapt to support Ed in using Ableton Live software and Push hardware. We also began to experiment with the configuration of the performance system, carried out further test screenings of the fixed works and worked on sketches for new pieces.

As an audiovisual artist with a more supporting role, my focus was to use my skills with Touch Designer and Ableton Live to facilitate real-time connections between the music and visuals. Once Matthew arrived, we were able to integrate his purpose-built artificial intelligence system, which split up video frames from Yuriko's photographic films, analysed their content, positioned in a latent space and added descriptors. While I was able to implement this system in Touch Designer, we were unable to complete a proposed system that would have to triggered images based on AI signal analysis of Ed's sax playing.

As the week progressed, the importance of involving Yuriko as performer became apparent, so I used MIDI controllers with Max to enable her to control the visuals and explore a VJ / conducting role as part of the ensemble.

Figure 2: Presenting the audiovisual works at scale in AMATA studio A

Figure 3: Matthew's AI system converted a video into still images, mapped in 2D space according to content

5.2 Performance at The Poly

The performance at The Poly at the end of the week was presented in two parts. The first half involved playback of re-edited original fixed works, while the second featured live versions of these works with AI-enhanced and real-time controlled visuals with improvised drums, sax and electronics – as well as the new material.

The diagram below shows the performance configuration. In the first half, my laptop was used for the audiovisual playback of the fixed work. In the second half, my laptop was used for:

- Playing back pre-recorded material in Ableton Live
- Live looping of Ed's saxophone (controlled by the Push and drum pads on Keith's
- drum kit)
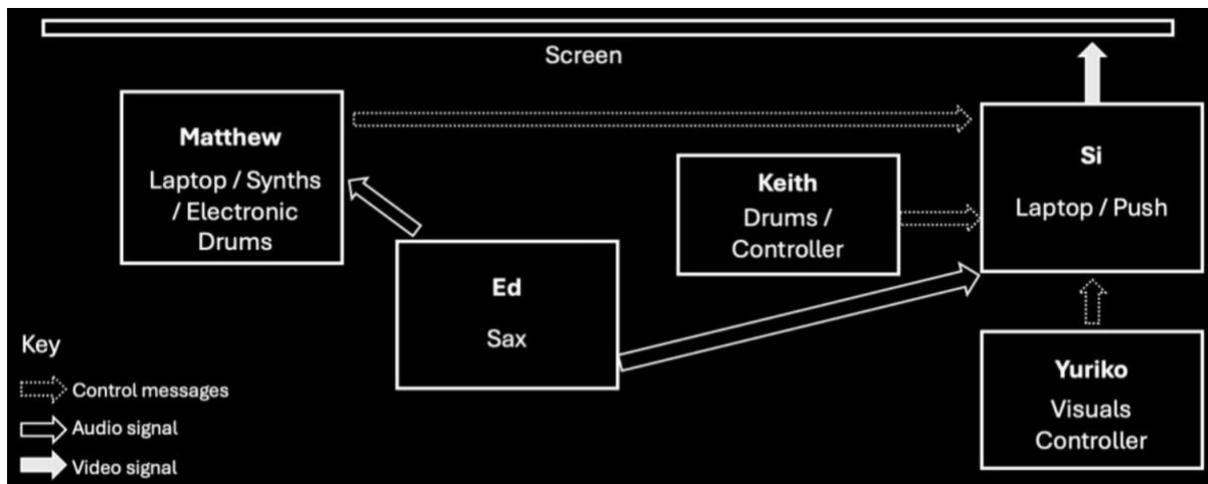- Touch Designer running real-time visuals controlled by Yuriko

Figure 4: Diagram of the performance system as presented at The Poly at the end of Week 1

5.3 Week 1 Reflection

While a success in terms of presenting some interesting material and involving all artists and artforms in a coherent performance system, there were several points to address:

- The performance system was over-reliant on my own machine and operation. The system had been put together quickly and was incomplete - leading to performance / presentation errors and giving me too much to do when rehearsal time was limited.
- The connection between Matthew and myself (as shown in Figure 1) did not fully work – which limited the intended use of AI.
- There was a consensus that the presentation of the fixed works at scale and the new material that had been generated during the later part of the week were the strongest aspects of the performance. The reworked versions of the existing pieces did not work so well, perhaps due to overcomplexity and lack of rehearsal time to develop some promising ideas.
- It was somewhat unclear how (in)formal the event was supposed to be. We approached it as more of an informal showing of work in progress, but the event was in a formal setting with a paying audience.
- The performance space was extremely limited due to the position of the screen towards the front of the stage.

5.4 Week 2 Development

The week began with a review of the performance, whereby it was agreed that while the final performance would again feature presentation of the fixed works, parts involving live

works should be more focused around new material and a more effective performance system. This entailed:

- A more evenly distributed performance 'load' among the performers.
- Reworking the AI element to explore the potential for generative AI trained on
- Ayatori material to develop the overall aesthetic and reveal its processes through
- the system visuals
- Refining the system for Yuriko to perform the visuals as a key part of the performing
- ensemble.
- The implementation of new audio and visual material recorded during a trip to Kennal Vale, a nearby nature reserve[6] and composed at AMATA.

The second week also saw the arrival of Katrina and Owen to work with student dancers. Again, taking a role that might have been carried out by the music intern, I spent several hours recording and editing audio of their movements with the intention of this material being incorporated into the music being created by Ed in Ableton Live.
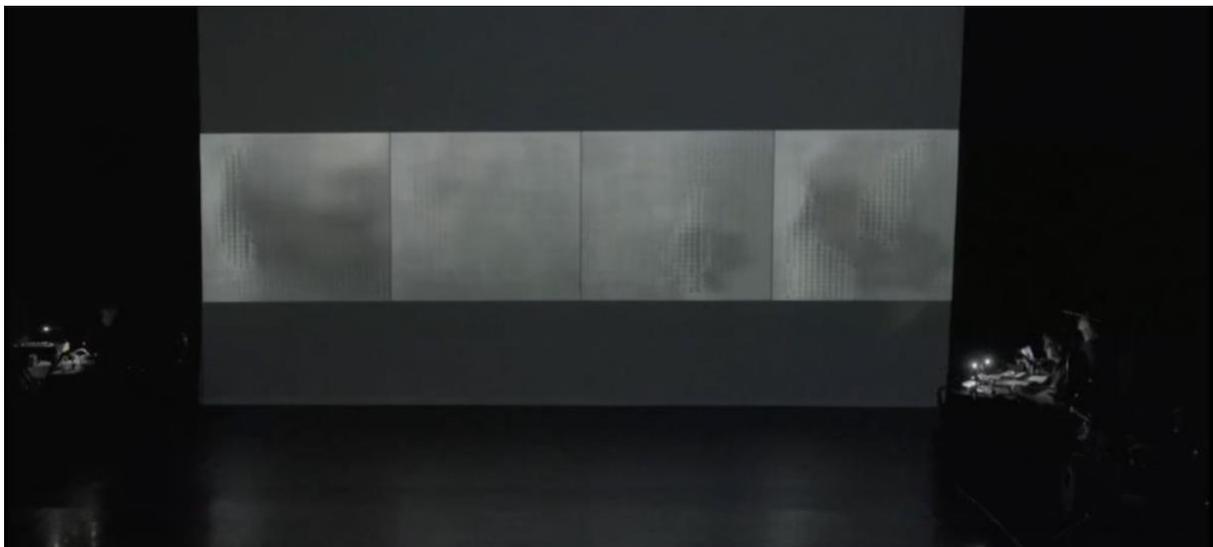

Figure 5: Visuals during the final live performance at AMATA included portrayal of the AI learning process mixed with 'found' footage using a live VJ system

My ability to input on this week was limited by other University commitments. Returning to the project on the day before the performance, there was still a huge amount to do in terms of completing audio editing and integrating video material into Touch Designer before a final run through. A lengthy list of tasks and extensive technical issues caused severe delays late into the night, nearly resulting in the cancellation of the performance.

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[6] https://www.cornwallwildlifetrust.org.uk/nature-reserves/kennall-vale

Figure 6: Dance performers during the final performance at AMATA.

5.5 Performance at AMATA

The final performance in AMATA Studio A comprised of a further re-edit of the fixed audiovisual works, dancers and the new material developed during the residency. Figure 2 below shows the reconfigured performance system, that included a much more streamlined visuals system, a more stable and expressive visuals controller for Yuriko and an increased technology role for Ed. There was also much more space available than at The Poly, allowing sufficient space for dancers and more effective positioning of music / visual performers.

The performance was filmed in its entirety, and was followed by filmed discussions with and between the artists which have been edited to created further documentary films.
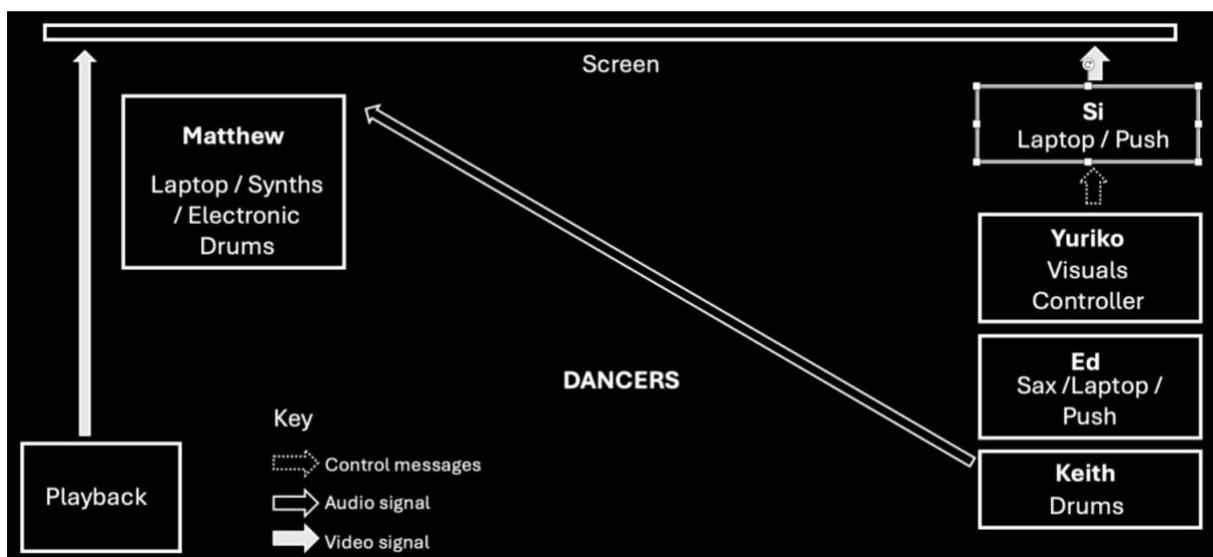

Figure 7: Diagram of the performance system as presented at AMATA at the end of Week 2

5.6 Week 2 Reflection

The final performance successfully incorporated the enhanced original works, new material created during the residency, dance elements, meaningful artificial intelligence elements, performed visuals and improvisation. Among the key successes were:

- Use of AI (see Figure 8): the new content generated through AI provided new aesthetic directions and partially revealed the artistic and technological processes to the audience.
- Performance system (see Figure 9): the reworked visuals system enabled Yuriko to have a more central and expressive role in the performance ensemble. Ed had more of a technology role. Matthew and Keith were able to improvise more effectively while my own role was less complex. Furthermore, content playback was handled much more effectively.

Unfortunately, there was not enough time to fully develop some of the material and integrate the dance elements more fully, for example by using the audio recordings of dancers' movements in the audio, or to more deeply explore the thinking behind the works with the choreographers.
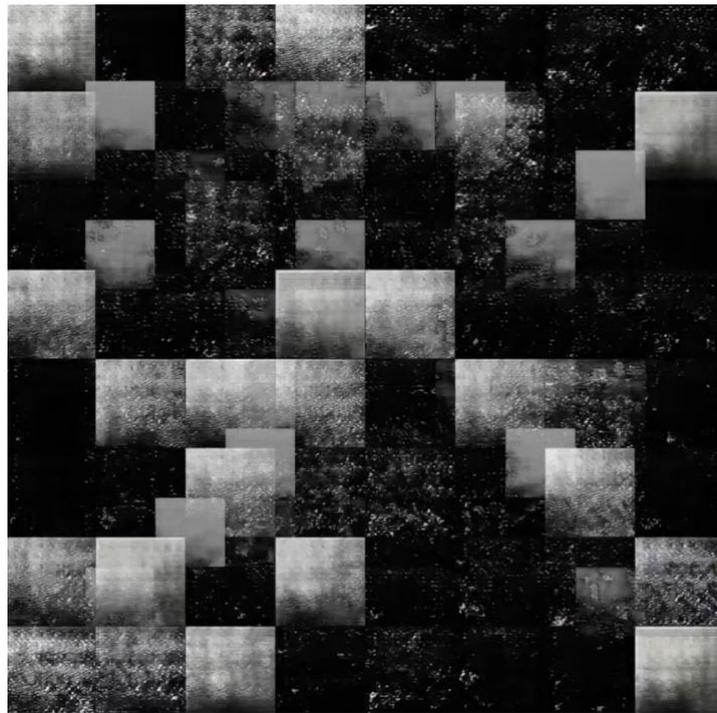

Figure 8: AI-generated material from Week 2

Figure 9: Si, Yuriko and Ed during the final performance - the VJ system was more embedded in the ensemble and Ed was making more use of technology

6. Reflection on Research Sub-Questions

6.1 How will the work be impacted by an in-person, time-limited process?

The in-person, time-limited approach enabled the rapid development of the project into new technological and aesthetic realms through spontaneous and rapid idea and material generation. It allowed for mistakes, false starts and reflections within a highly improvisatory approach. The existing fixed audiovisual works were further edited to make them suitable for presentation at scale, while new work following new aesthetic directions was created and performed. Crucially, this work challenged all of the artists to reflect on and expand their existing practice and skills in what was a highly pressurised yet highly productive two-week period.

The residency demonstrated the need for regular production meetings and the mid-point performance provided a highly useful reflection point to refocus the project goals. Further focus was provided by the residency taking place in the same space as the final performance.

6.2 How might the work be developed through artificial intelligence?

The artificial intelligence systems designed by Matthew were successful in bringing new aesthetic directions to the collaboration and revealing the creative process to the audience – perhaps making In addition, the residency was successful in terms of the team members'

understanding of AI and its creative potential. Both these points speak to McCormack et al's (2020) observations. Yuriko observed how the techniques lead to questions of the role of the (un)conscious and intention – which is highly relevant to the improvisation running throughout the project and the jazz backgrounds of the musicians.

6.3 How might the work be developed through real-time audio and visual technologies?

Ableton Live, Max, Touch Designer and gestural controllers proved to be highly useful in connecting the audio and visual aspects in a performance setting to achieve audiovisual interactivity and presenting recorded material alongside live performers (Gibson 2022).

Through this focus, the project has impacted the skills and practice of several team members – Yuriko had not previously considered VJing as related to her practice, Ed performed with Ableton Live and Push as well as saxophone, and I gained a deeper knowledge of Touch Designer and working collaboratively as a technologist.

Technical challenges during the course of the project did reveal the need for high levels of technology-specific expertise – whether software-specific knowledge to problem-solve in pressurised situations or controlling the lights in the building. A smaller but still significant point was compatibility issues due to different versions of the same software.

There was a shift in the project goals as outlined in the initial project proposal, which was to create an 'immersive performance environment' involving screens at the sides of the stage as well as the back. Technical issues prevented this being realised and though this took up valuable time and created an additional expectation, the other project outcomes have more than compensated for this shortcoming.

6.4 How might the work be developed through the inclusion of additional artforms and personnel?

The project was hugely ambitious in terms of developing a partnership producing fixed audiovisual works into a performance collaboration involving live acoustic instruments and electronics, artificial intelligence and dance in the space of two weeks. This was further complicated by the limited availability of several members of the team, who were often working at different times, juggling multiple roles and working in limited space. This meant that finding one's role and understanding others' roles was challenging and that key themes and ideas could be lost.

This was mostly mitigated through regular production meetings and after-hours working. Perhaps the key approaches were flexibility, adaptability and the creation of new material over which all collaborators felt ownership – which again invokes the similarity with jazz improvisation.

It can be confidently concluded that the project was successful in terms of creating a multisensory experience (Ikoniadou 2014), with an effective balance of audio, visual and dance elements (d'Escriván 2012).

7. Conclusion and Recommendations

7.1 How might a series of fixed audiovisual works developed in lockdown be developed for live performance through a two-week residency?

Through examination of four sub-questions, this document provides a detailed account of how this took place during the residency through in-person, time-limited working, the introduction of real-time technologies, the incorporation of AI techniques and through interdisciplinary working. The residency resulted in a successful live performance at the intersection of photography, audiovisual composition, jazz, electronic music, VJ-ing, dance and artificial intelligence and lays the groundwork for future projects in these and related areas.

7.2 Further Findings: Residency Recommendations

A project of this complexity would benefit from clear briefs for new team members to help them understand their role in the project, accompanied by regular, perhaps daily, production meetings to reiterate project goals. This would also help mitigate against partial attendance, differing expectations and identify needs for additional resources such as breakout spaces and technical support.

8. References

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