

DIGITAL HUMANITIES
at the University of Aizu





THE UNIVERSITY OF AIZU 1993 — To Advance Knowledge for Humanity — 会津大学

DIGITAL HUMANITIES

Arts ▪ Languages ▪ Human-Centric Software

GT Research Orientation
Fall 2026

Evgeny PYSHKIN

ピシキン エヴゲニー

Ph.D.

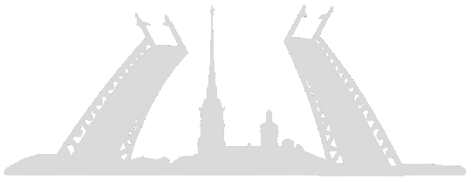
Senior Associate Professor

Office 342-B



*"Computer science draws upon perspectives from many disciplines and has a symbiotic relationship with the liberal arts disciplines, so it might be considered the ultimate of them" **

* H.M. Walker and C. Kelemen, "Computer science and the liberal arts: a philosophical examination," ACM Transactions on Computing Education (TOCE), Mar 1, 2010, vol. 10, no. 1, pp.2:1–2:10.





Introduction

EXPERTISE, LINKS, AND INTERESTS

Academic Expertise: Courses and Research



Undergraduate Courses

- Introduction to Programming
- Programming in C
- Introduction to Data Management

Graduate Courses

- Software and Cultures

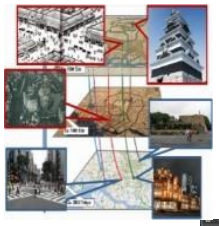
Open Lectures

- iCALL
- Music
- Fine Arts
- Sculpture
- Pottery

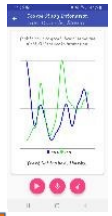
- **Human-centric applications**
  - iCALL environments
  - Speech processing applications
  - Information system for travelers
  - Educational software
- **Software engineering**
- **Art and Humanities**
  - Classical music and fine arts
  - Architecture and history
  - Opera and ballet

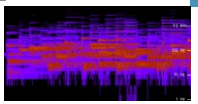
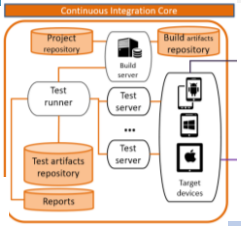
*"We are in era where we are reimagining nearly everything… powered by new devices, plus connectivity, plus new user interfaces, plus **beauty**…"*

Mary Meeker



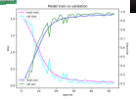


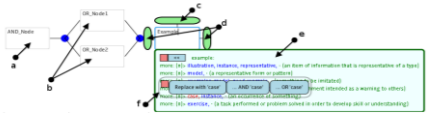










I AM a FRIEND OF

ROYAL BALLET & OPERA

Music: Listening, Performing, Researching…



Introspective…









Introspective…

八戸工業高等専門学校
NATIONAL INSTITUTE OF TECHNOLOGY
HACHINOHE COLLEGE



DIGITAL HUMANITIES:
Prima Facie

Interdisciplinary, Multidisciplinary & Transdisciplinary Education

Evgeny Pyshkin
University of Aizu

2024 08/11
12:00 – 15:00

DIGITAL HUMANITIES at
THE UNIVERSITY of AIZU
OPEN CAMPUS
2024

Royal Doulton's Vintage Figurines
and
FINE PORCELAIN RESTORATION WITH 3D MODELING and KINTSUGI ART

Research Quadrangles 342-D

Aalto and Japan: Interinfluence of Environmental Integration Architecture Idioms

Evgeny Pyshkin
Software Engineering Lab
University of Aizu



The University of Aizu, Evgeny Pyshkin, 2012



Aalto House in Riihitie,
https://www.discoveringfinland.com/destination/the-aalto-house/

nordcode IDBM
Evgeny Pyshkin, Nordcode-2019
Nov 27 – 29, 2019

会津大学
Aalto University



会津大学
DIGITAL HUMANITIES at the University of Aizu



佐藤賢太郎先生の宙 会津へ 世界へ
Kentaro Sato's Universe for Aizu and for the World





Evgeny PYSHKIN
University of Aizu

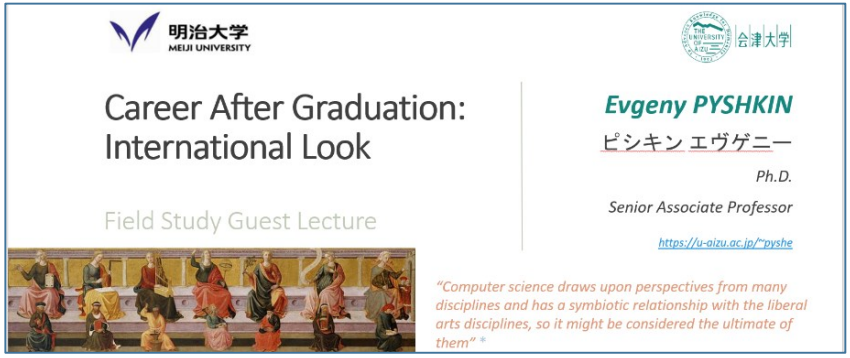
The 2024 Open Campus Public Lectures

* Kentaro Sato's open air stone sculpture in Ryuunji Temple, Iwaki, Fukushima pref. *(2022)*

Life of a (CS) Researcher, or “Pro Amateur”* Concept…

Pervasiveness of CS and SE

- Open source initiative
- Software creators are never more just from an elite circle of professionals
- LLM disrupts the live of everyone



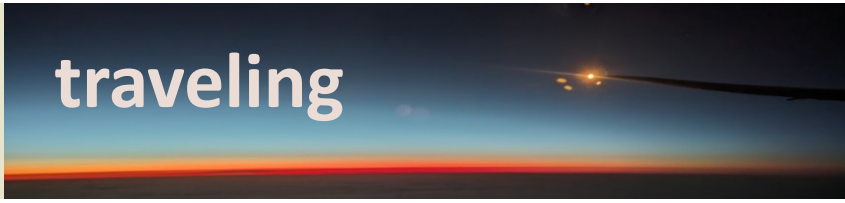
Still there is a professional occupation “researcher/scientist”

- Lab work, creating models and software, assessment and verification
- Dissemination of results and achievements
  - Journal publications
  - Seminars, workshops,…
  - Conference presentations, networking…

Embracing uncertainty and acknowledging gaps in knowledge can enhance creativity and innovation

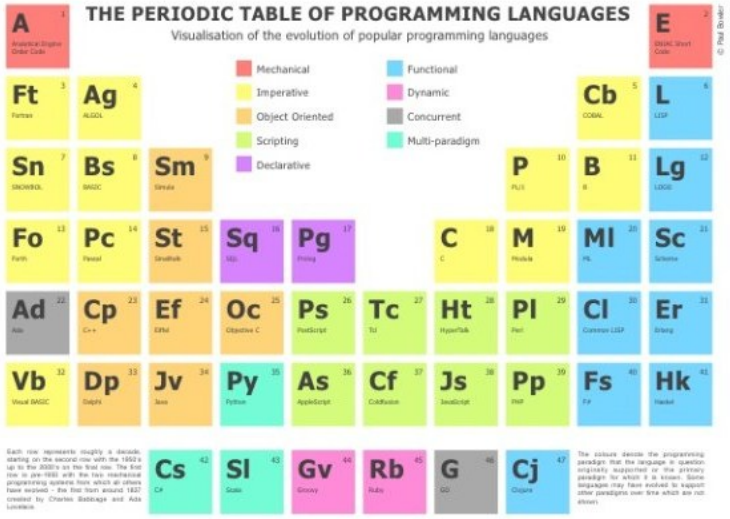
Enlightenment assumes **inquisition and exploration of the unknown**

Importance of creating environments where **questions and exploration are valued over immediate answers**



** Thanks to Maxim Mozgovoy*

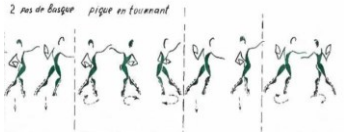
Exploring the World Through Languages



*















* Kerry Pain, The most popular coding languages of 2015, June 5, 2015, https://www.linkedin.com/pulse/most-popular-coding-languages-2015-kerry-pain

** Image from: https://www.eltconcourse.com/training/courses/transcription1/transcription.html

– Mikä on ensimmäinen kieli, joka kehittäjän tulee osata?
– Suomi.

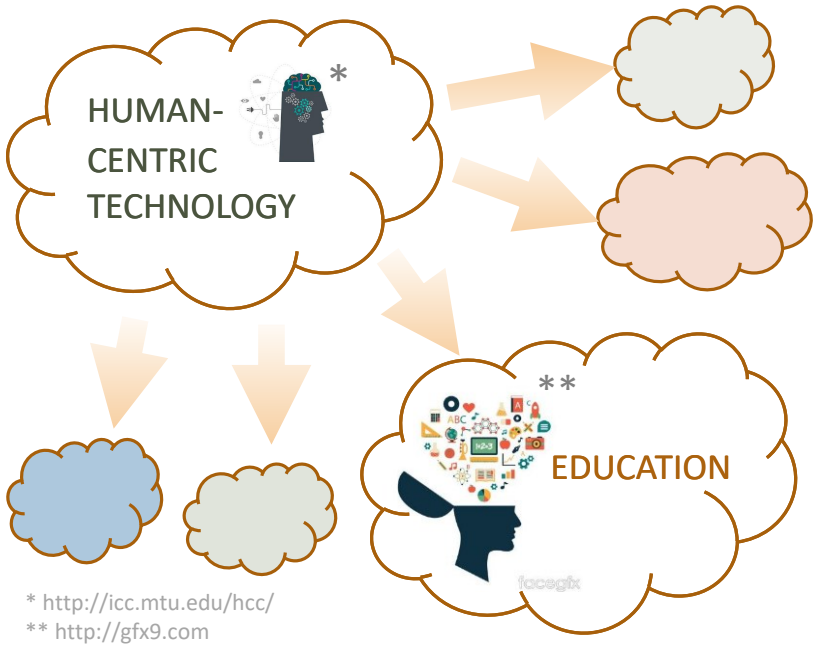


– What language has the developer to know first of all?
– English.

開発者はまずはじめに何語を知るのか

日本語

Areas and Project Themes

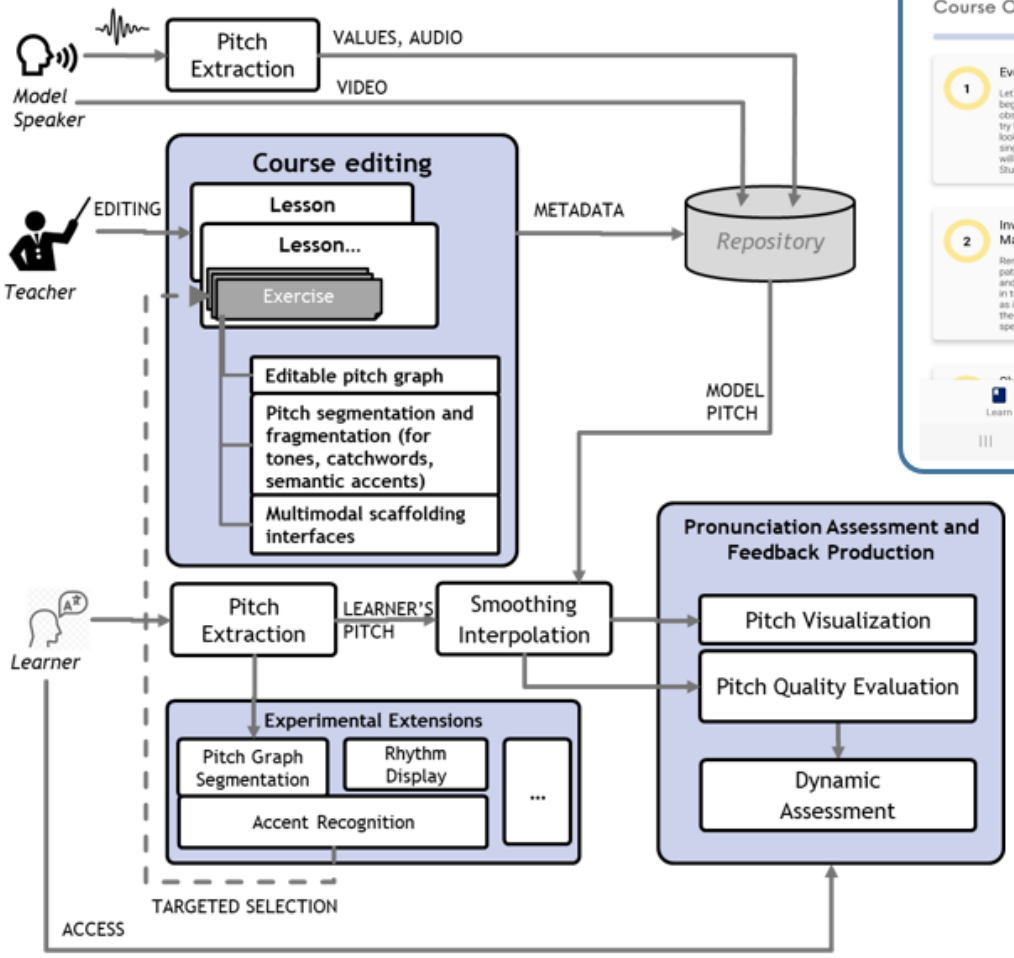


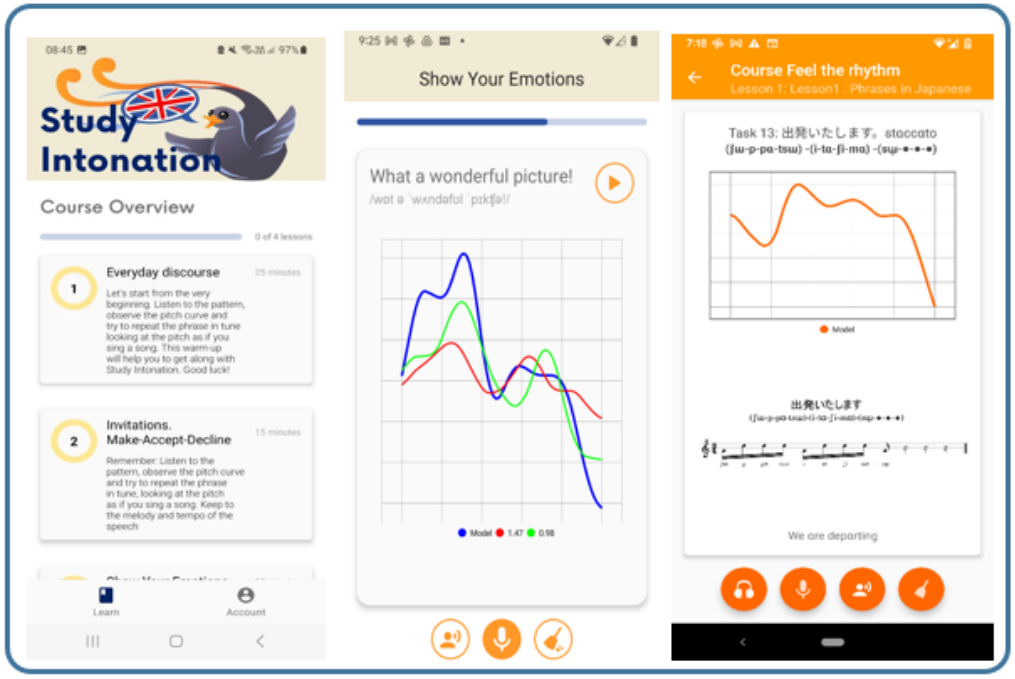
* http://icc.mtu.edu/hcc/
** http://gfx9.com

FROM AREAS OF INTEREST TO GT PROPOSALS (AY 2026 THEMES)

Area: iCALL and iCAPT Systems

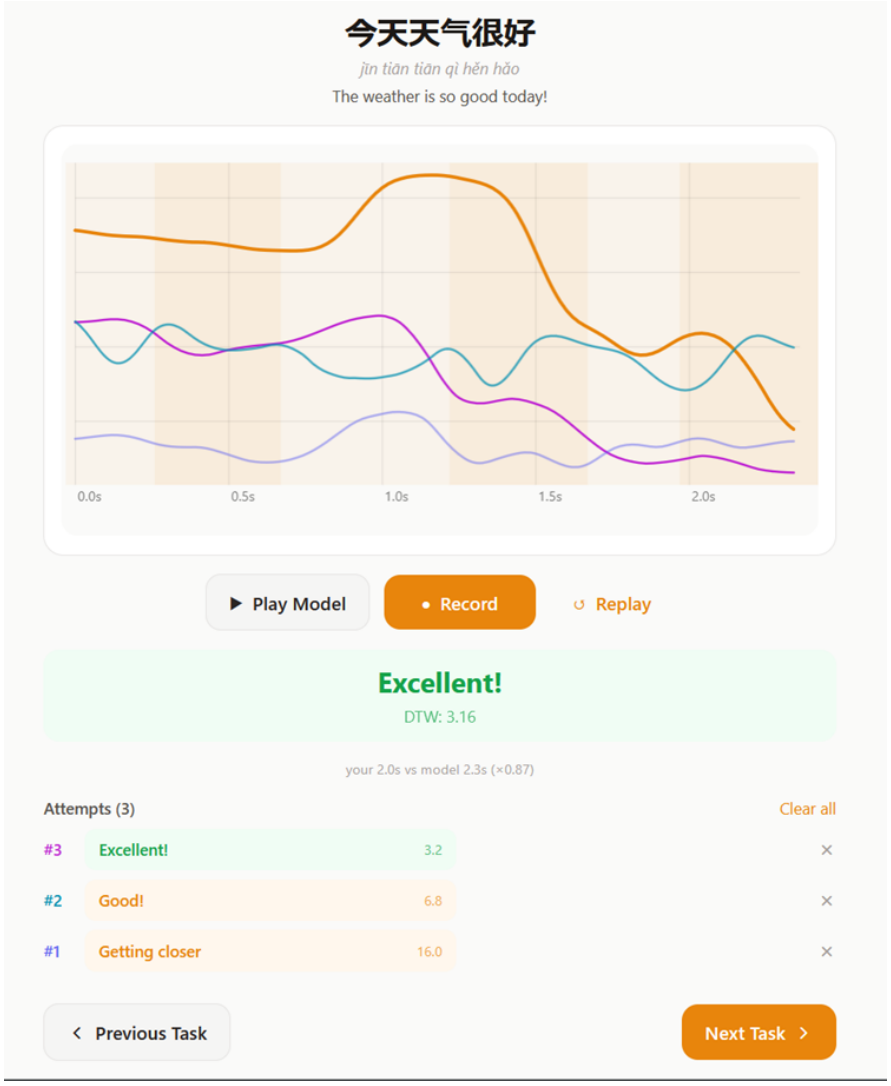
- iCALL – Intelligent Computer-Assisted Language Learning
- iCAPT – Intelligent Computer-Assisted Pronunciation Training



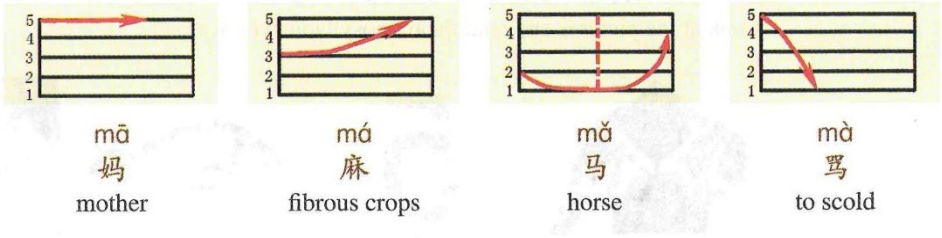


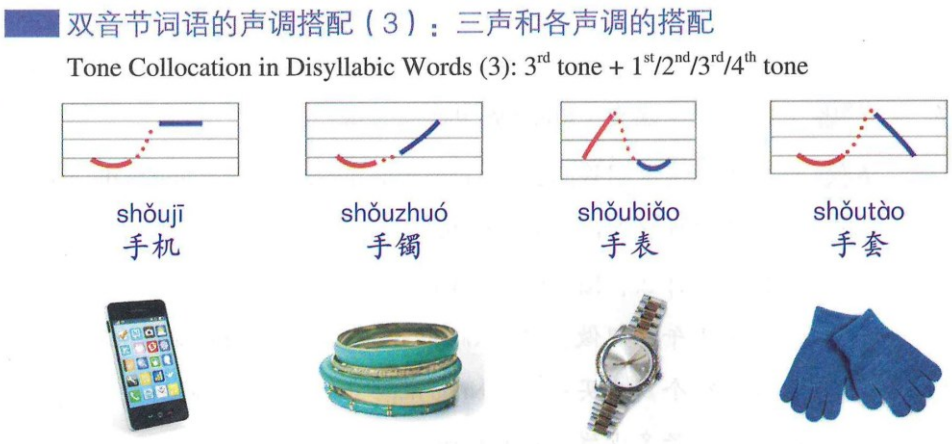


Project 1: Graphic Visualizing of Collocated Chinese Tones within the Phrase Intonation Modeling for an iCAPT System



- Pitch graphs are indicative but not always instructive
- Other visual keys are required to give hints to a learner

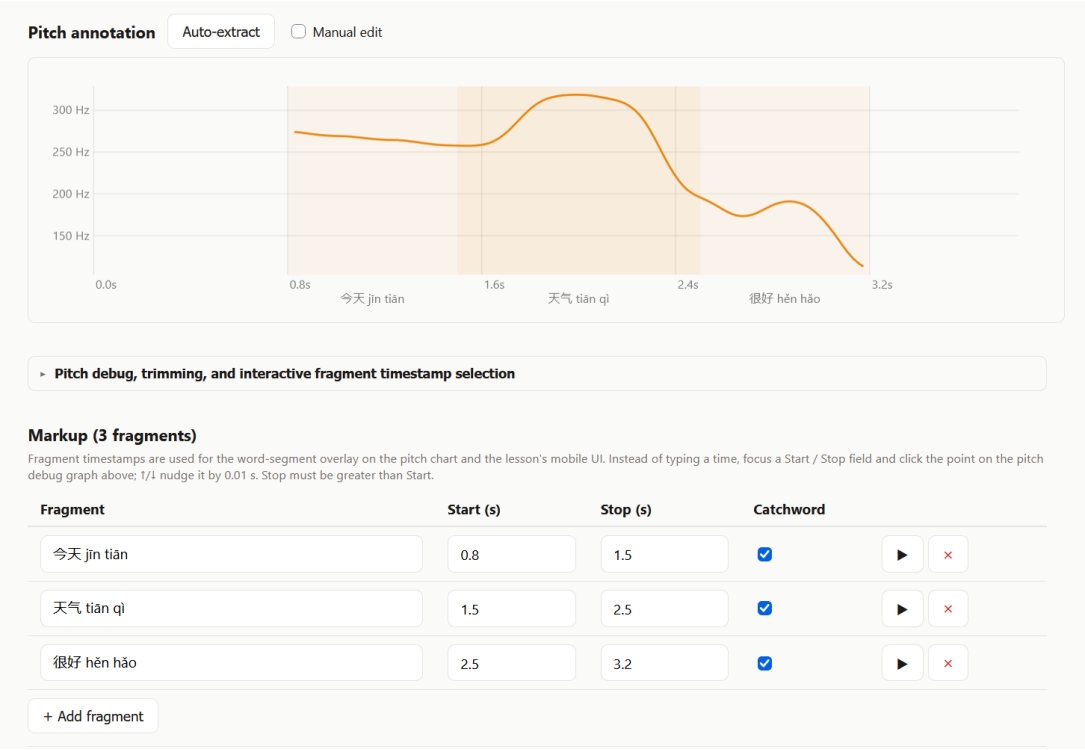


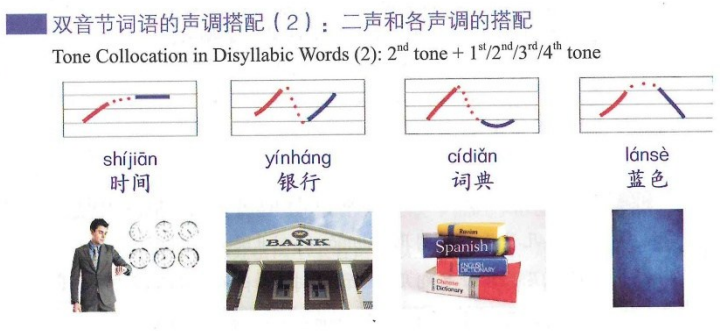


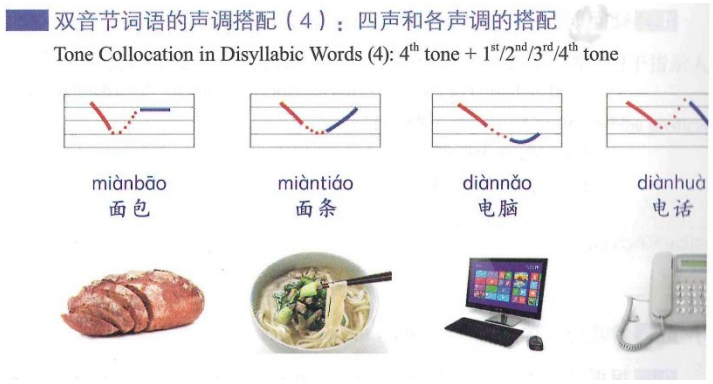
Project 2: Interface for Phrase Segmentation within the iCAPT Pronunciation Course Editor

There is some implementation but there is space for improvement

- Making the interface more interactive
- Automating phrase segmentation
- “Synchronizing” with simplified notations





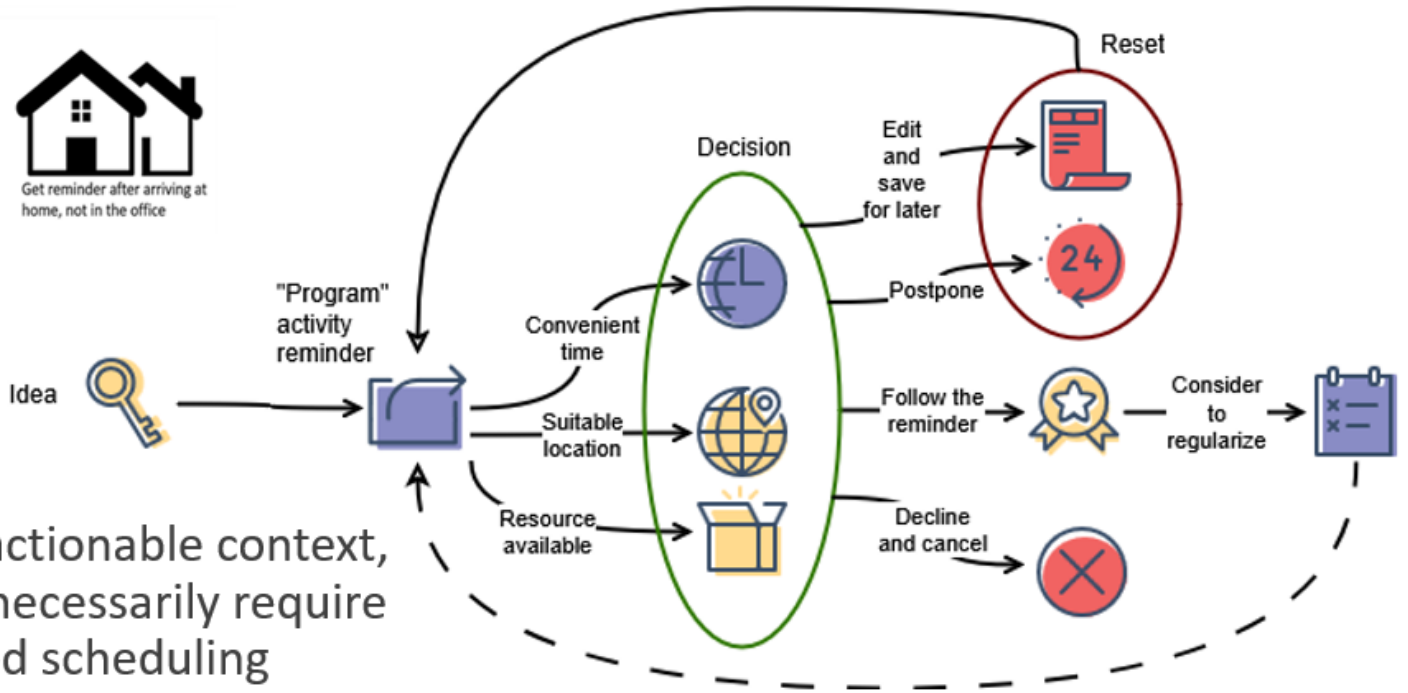


Area: "Soft Planning" – Modeling Smart Reminders for Handling Non-critical, Deferred, or Weakly Planned Activities

- Unfixed, infrequent situations assuming loosely planned activities
- Can be deferred until suitable conditions are met

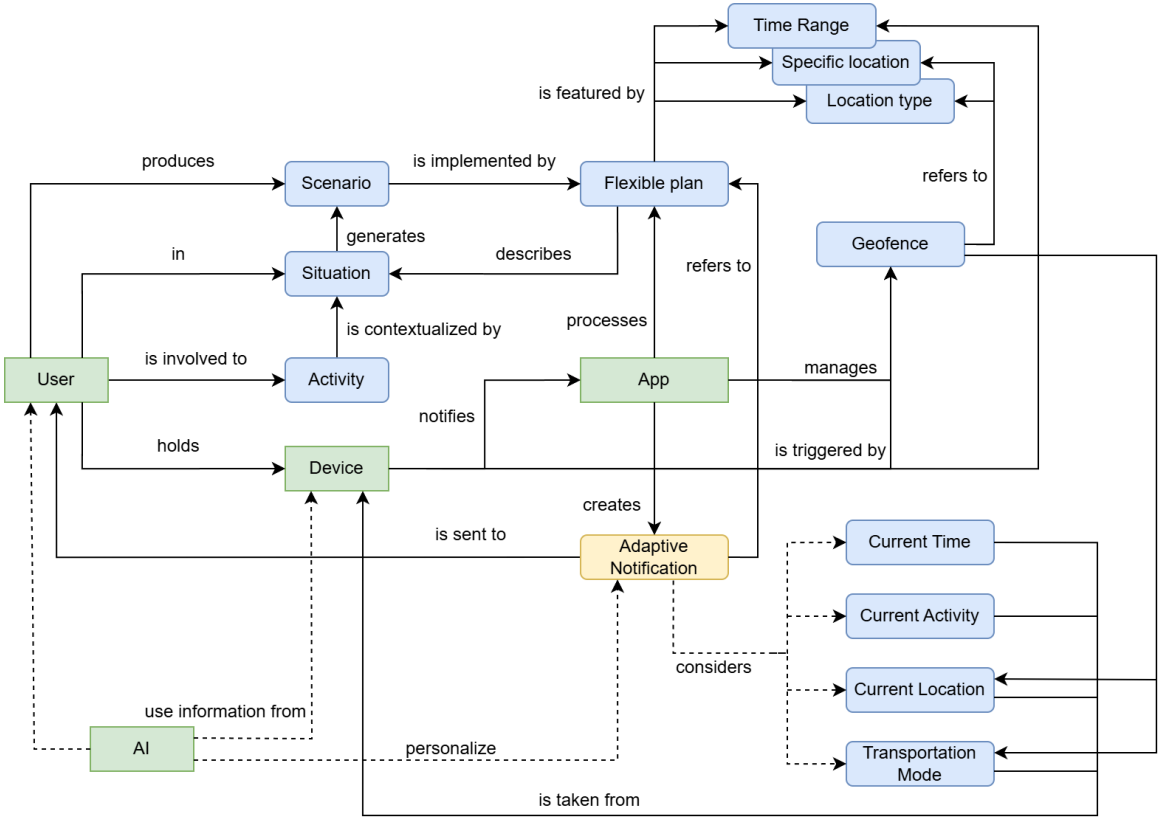


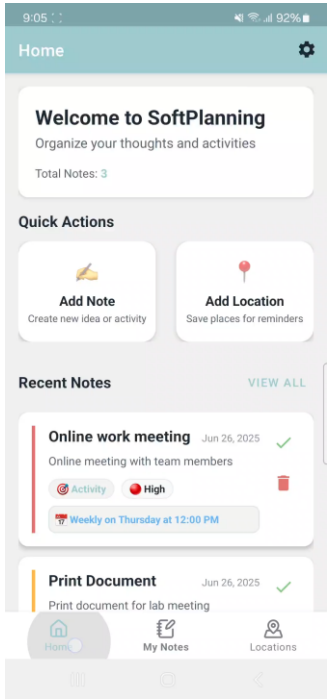


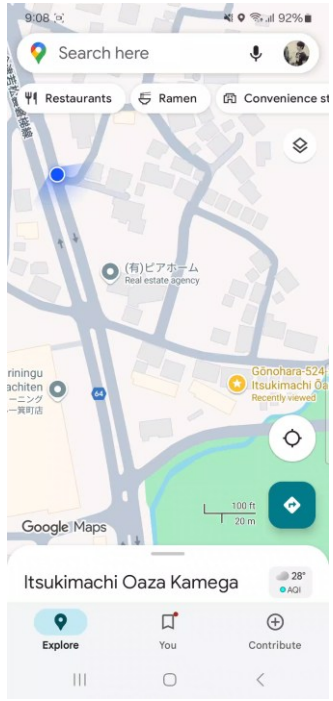


- Situational and actionable context, which does not necessarily require strictly formalized scheduling

Project 3: Mobile platform for weakly planned activity adaptive and intelligent notifications







- Ontology modeling
- Extending software features

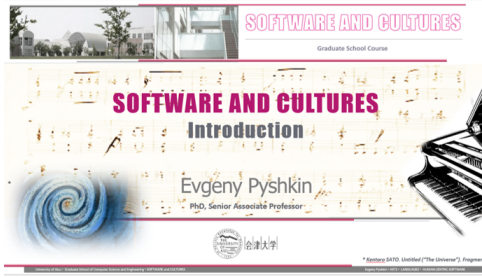
Gozaly, A. and Pyshkin, E. (2025) Lost by over-management: Adaptive notification model for handling weakly planned activities. Eng. Proc., 107(1), 4. **Gozaly, A. and Pyshkin, E. (2025)** Flexy Diary: Personalized services for handling weakly planned activities. In: H. Fujita et al. (eds) Frontiers in Artificial Intelligence and Applications, vol. 411 "New Trends in Intelligent Software Methodologies, Tools and Techniques", 160--173. IOS Press.

Area: AI-Driven Generative Arts

In connection with the graduate course “Software and Cultures”

Designing the Course ”Software and Cultures”: Grounds and Objectives

- Targeting the problems of technocratic education, which prioritizes the development of professional skills over serving students’ needs across all aspects of their life.
- With ubiquitous access to technology support, the young who are assumed to be AI-literate but are actually AI-dependent



- The technology/engineering students are not actively engaged in understanding the serious arts, the latter including both traditional and paradoxically those appealing to the contemporary vision and involving generative AI.

AI Art vs Conventional Art

Aspect	Generative AI ✅ ❌	Conventional Art ✅ ❌
Speed	✅ Very fast, can create art in minutes	❌ Takes days or weeks to complete a detailed artwork
Cost	✅ Cheaper, reduces expenses for companies	❌ More expensive, requires hiring artists
Accessibility	✅ Easy to use, no artistic skills needed	❌ Requires training and years of experience
Scalability	✅ Can create a large volume of content quickly	❌ Limited, as humans need time to create each artwork
Originality	❌ Lacks emotional depth and unique creativity	✅ Every artist has a personal style and vision
Job Impact	❌ Replaces traditional artists, causing job loss	✅ Supports jobs for artists, illustrators, and designers
Ethical Issues	❌ Raises concerns about ownership and fairness	✅ Artists own their original work and creative rights

Flores Medina, Bryian José (2025) Impact of Generative AI on Art Creation and Media Production. “Software and Cultures” Course, Final presentation.

Project 4: Critical analysis of AI generative visual art works through AI-driven reviewing

The project addresses the challenges of the present-day AI-driven visual arts

- Impact on traditional arts;
- The possibilities they provide;
- The risks they brings to humanity.

The work is about developing a platform for reviewing AI-generated art with combining the human expertise with AI-driven image analysis.



Poster for a new zombies movie. It is a zombies movie but it is about cats vs zombies. The main character is a Bombay cat. The poster has the shape to be placed in theaters.

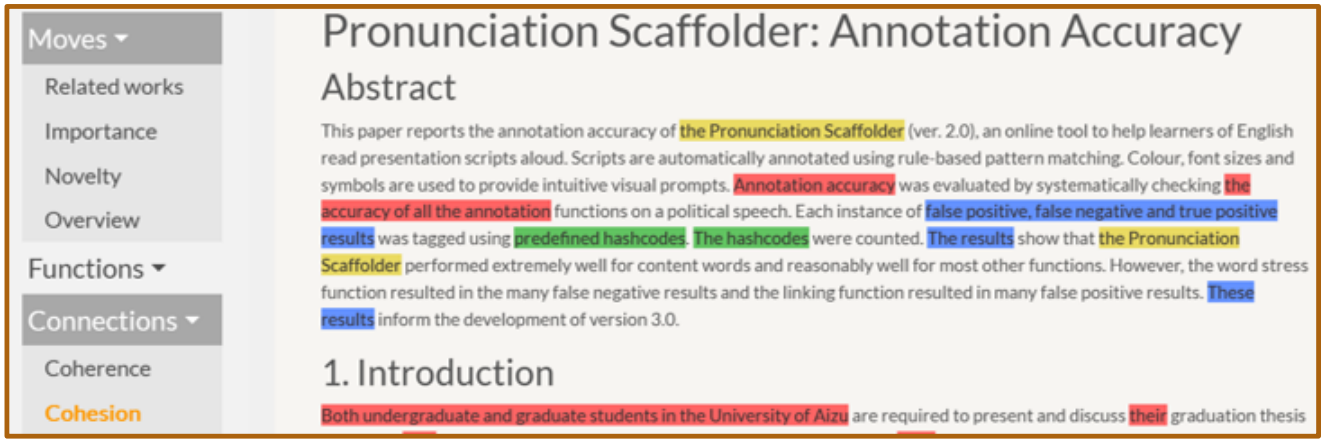
- By Bryand Flores

Flores Medina, Bryian José (2025) Impact of Generative AI on Art Creation and Media Production. "Software and Cultures" Course, Final presentation.

Area: Visualizing Language Features for L2 Learning and L1 Acquisition

LANGUAGING | VISUAL MODELS | META-DESIGN | iCALL | SCIENTIFIC LANGUAGE LEARNING

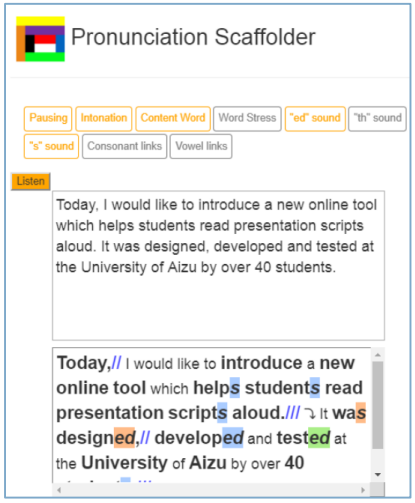
THOUGHT-PROVOKING LEARNING | FEEDBACK | CONCEPTUALIZATION | CONTEXTUALIZATION

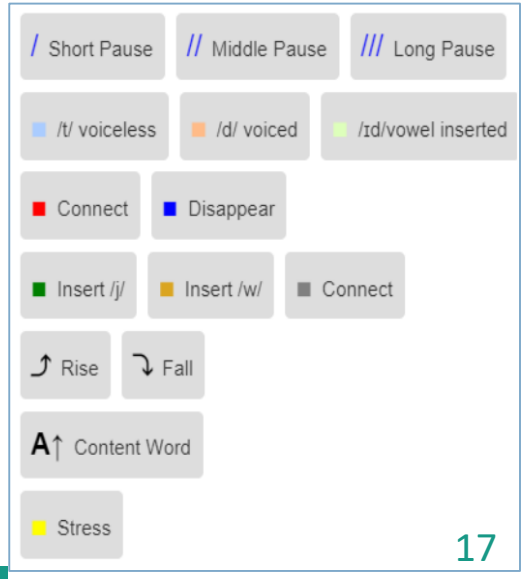


Pronunciation features for visualization

#	Feature	Purpose of annotation
1	Pausing	show short, medium and long pauses
2	Intonation	show falling and rising intonation
3	Rhythm	stress content words more than function words
4	Word stress	locate syllable carrying primary stress
5	Sounds	disambiguate between letters realized by different sounds
6	Linking	shows elision, intrusion and linking

- **Context-sensitive timeline** visualization of tense relationship to time
- **Scientific learning of native language** employing the models of L2 pedagogy
- **Extending IPA transcription** to address language rhythmic features

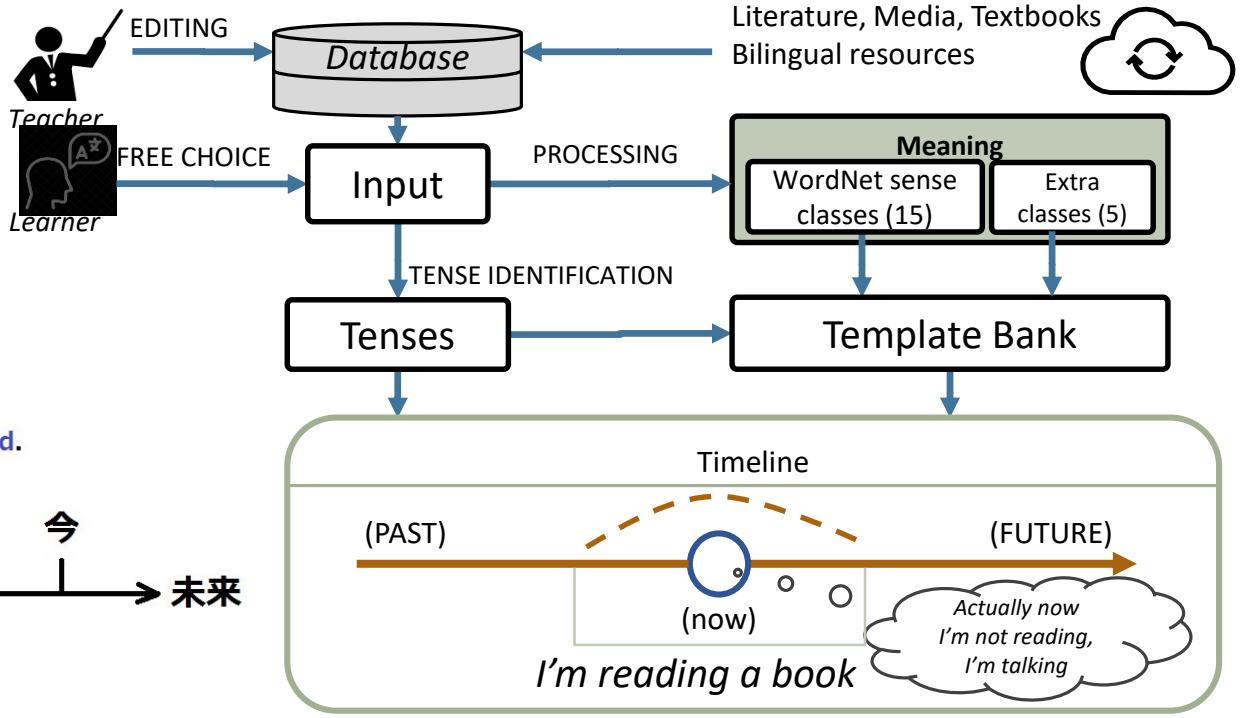


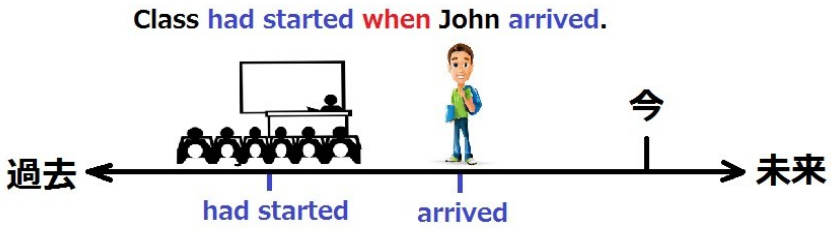


Project 5: Visual Interfaces for language learners

Complex tense constructions

- Timeline as a tool and interface to help language learners
- Modeling related language patterns





Future Perfect Simple Future Continuous Future Perfect Continuous Future Simple Past Continuous Past Perfect Continuous Past Perfect Simple Past Simple
Present Continuous Present Perfect Continuous Present Perfect Simple Present Simple

Result: Grammatical Tense and Meaning in Context

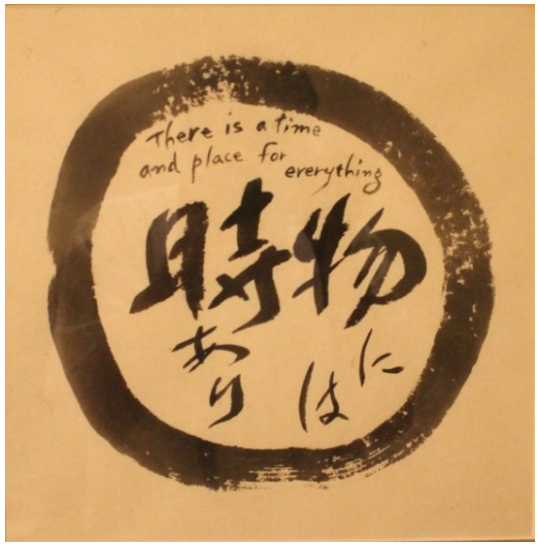
I could not help laughing at the ease with which he explained his process of deduction.

When I hear you give your reasons, I remarked, the thing always appears to me to be so ridiculously simple that I could easily do it myself, though at each successive instance of your reasoning I am baffled until you explain your process.

And yet I believe that my eyes are as good as yours.

Blake, J. (2020). Automatic identification of tense and grammatical meaning in context. *ICCE 2020 (vol. II),* 739-742.

Blake, J., Pyshkin, E., & Pavlík, Š. (2022). Automatic detection and visualization of information structure in English. *6th NLPIR,* 200-204.



Other Ongoing Projects

NOT “OFFICIALLY” OFFERED AS AY2026 THEMES BUT CAN BE DISCUSSED

Area: Cultural Studies – Pottery

Learning Connections between Western and Japanese Traditions

From organizing an exhibition to advanced cultural studies and computer technology applications

- Existing links between English and Japanese pottery making traditions
- Precious objects of decorative ceramics
- Reconstruction of broken objects using Kintsugi merged with the cutting-edge 3D modeling, virtualization, and digital fabrication technology

金継ぎ





Bowl repaired by Prof. Yohei Nishidate

Pyshkin, E., Sato, R., Nassani, A., and Blake, J. (2024) Transfigured reminiscence: Vintage porcelain figurine reborn through 3D virtualization and Kintsugi art. The Kyoto Conference on Arts, Media & Culture 2024: Official Conference Proceedings, 179--187, 2024.

Pyshkin, E., Sato, R., Nassani, A., and Blake, J. (2025) Virtualization for Kintsugi art: Damaged porcelain figurine recreation supported by 3D modeling computer technology. In: Filipa Martins de Abreu et al. (eds) ARTeFACTo 2024 Macao: 4th International Conference on Digital Creation in Arts, Media and Technology. Creative Digital Intelligence. Conference Proceedings, USJ Academic Press, 2-8.

Project: Virtual modeling of the fragmented works of plastic arts

Extending our earlier works on pottery restoration with an idea of creating 3D models and digitally fabricated artifacts to be used for educational and research purposes, including reconstruction of the lost or damaged objected available only in fragments



Area: Performing Arts



There is space for many interesting themes

- Manageable performance data
- Sharing memorable experiences
- Managing collection of recordings
- Recommendation systems
- …



Project: Personalized virtual theater diary

General Concept

- Manageable information representing the links between/to:
  - Work
    - Title, genre, creation time, …
  - Author
    - Composer, choreographer, …
    - Director, stage designer, costume designer …
  - Performer
    - Dancer, Musician, Singer …
  - Beholder
    - Attending performance date, watching stream,…
    - Traveling experience
    - Personalized list of favorites, etc.
  - Media
    - DVD, Blue-ray, video file, stream, …
    - Images, posters, …
  - …



Informal and



personalized

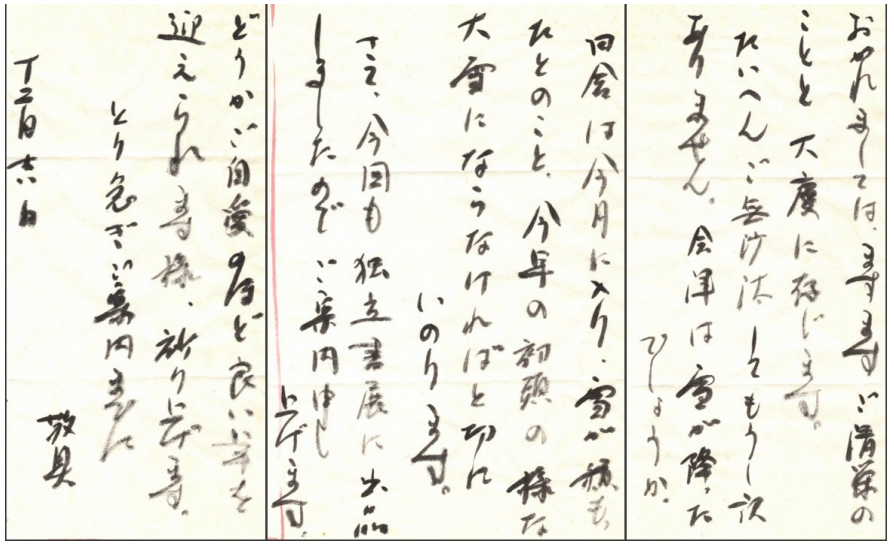


Area: Automating Recognition of Antique Documents, Calligraphy, and Engravings

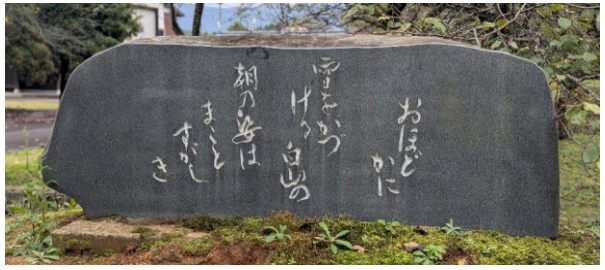
- Addressing a problem of recognizing a highly cursive Japanese writing style used in many Japanese historical documents and books (mostly from Edo period)
- Recognition of hand-written calligraphy-style writing
- Reviving the antique woodcut printed books for contemporary readers
- Unraveling the engravings on old memorial stones and monuments to enhance traveling and history learning experience to make it genuinely meaningful and truly memorable

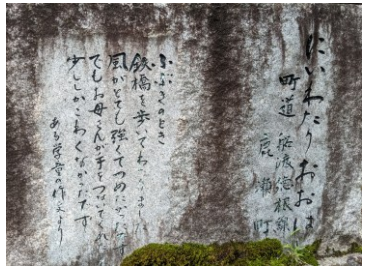


Mantei ŌGA (author), Utagawa KUNISADA (illustrator), Yamato Bunko, vol. 50, gōkan, late Edo period. Own collection.



Calligraphy style handwritten letter fragments. Own archive.





Project: Decoder-only Transformer for Optical Character Recognition* and Its Adaptation for Japanese

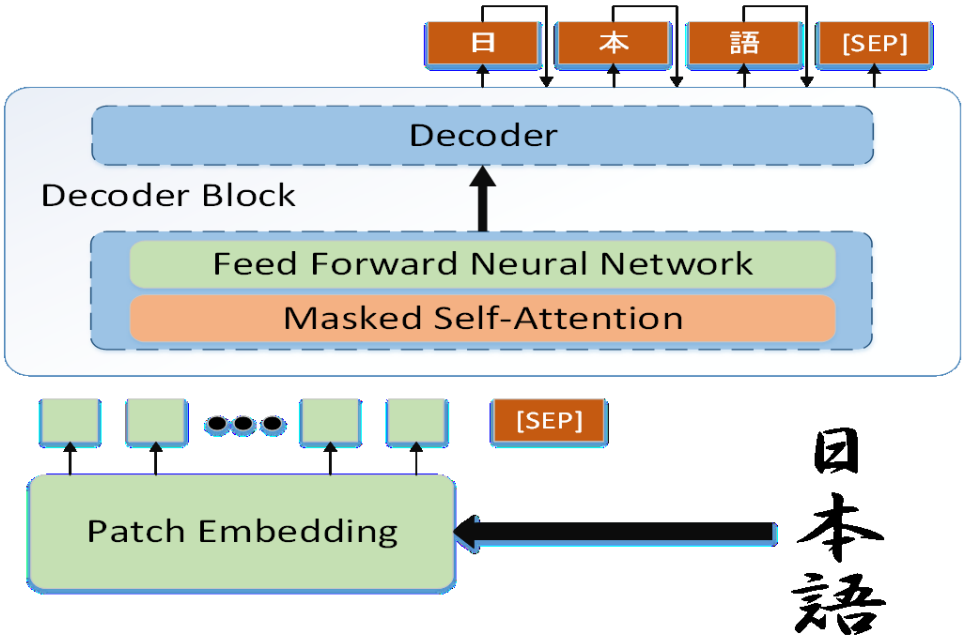
Hugging Face

ORIGINAL METHOD

- Fujitake (2024)* suggested a method to use the pre-trained language model, which is additionally trained to recognize patch embeddings of images. This model is utilized as a decoder in decoder-only architecture
- The author trained the models for English and Chinese
- We applied this model to Kuzushiji recognition
- The method achieves state-of-the-art results in both languages

SUGGESTED ADAPTATION

- Pre-trained language model **Japanese-GPT2-small** from Rinna***



* Fujitake, M. (2024), DTrOCR: Decoder-only transformer for optical character recognition. Proceedings of the IEEE/CVF winter conference on applications of computer vision.
** Kim, D., Bogach, N., & Pyshkin, E. (2026). LLM for Japanese Text OCR: Automating Kuzushiji Recognition Using Decoder-Only OCR Architecture. Engineering Proceedings, 143(1), 36.
*** Sawada, K. et al. (2024). Release of pre-trained models for the Japanese language. arXiv preprint arXiv:2404.01657.

Project?..
thinking …

Access the GT theme proposal

Couldn't decide on the topic?



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poetry,
dance,
architecture,
computers…

