

# Zixiu “Alex” WU

## NLP Researcher & Marie Curie Industrial PhD Candidate

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- **Research Interests** : NLP for healthcare, Natural Language Generation, Natural Language Understanding, Conversational AI, Dialogue Evaluation.
- 4 years of NLP experience + 3 years of collaboration with academic & industrial partners on AI for healthcare.

## 🔍 RESEARCH EXPERIENCE

**ACADEMIC (PHD) : ANALYTICAL & ASSISTIVE NATURAL LANGUAGE PROCESSING FOR COUNSELLING** 01/2020 - 06/2023

Philips Research & University of Cagliari

📍 Eindhoven, NL

**Main Advisor : Rim Helaoui (Philips)**

- Conducted 1st ever laypeople-vs.-experts human evaluation for machine-generated therapist responses, and found experts to be more consistent than laypeople despite 1) moderate correlation between the two groups and 2) low intra-group agreement for GPT-3-produced responses. Paper under review for ACL 2023.
- Built the 1st ever benchmark for next-move therapist action forecasting in live counselling sessions. 1 paper presented at Interspeech 2022.
- Created the 1st ever publicly and freely available expert-annotated dataset of counselling dialogues. 1 paper presented at ICASSP 2022.
- Probed the relation between empathy in social media and empathy in counselling, and examined the effect of transfer learning from the former to the latter. 1 paper presented at CLPsych 2021.
- Authored 3 other publications on NLP for counselling at impactful conferences.

**INDUSTRIAL : MARIE CURIE FELLOW AT DEPARTMENT OF AI, DATA SCIENCE & DIGITAL TWIN**

01/2020 - PRESENT

Philips Research

📍 Eindhoven, NL

**Team Lead : Aki Harma**

- Led 1st domain-knowledge-based AI-driven analysis of Philips call center data to identify key reasons affecting customer experience, reaching 80% accuracy and still improving.
- Developed AI-based forecasters of ICU patient condition deterioration using texts and vitals records.
- Created an empathetic and commonsense-aware AI-powered customer support bot that follows up with patients. The bot was demonstrated on behalf of Philips to EU and Dutch government officials.
- Analysed social media data using advanced deep learning to pinpoint main reasons behind complaints about certain Philips devices.
- Authored 3 invention disclosures.
- Mentored 2 junior data scientists over their internship programmes.

**ACADEMIC (MASTER'S) : PROBING THE ROLE OF VIDEO CONTEXT IN MULTIMODAL MACHINE TRANSLATION WITH SOURCE CORRUPTION** 05/2019 - 09/2019

Imperial College London

📍 London, UK

**Advisor : Lucia Specia**

- Experimented with MMT on English subtitles with varying degrees of verb masking, winning first place on Challenge leaderboard and proving contribution of visual modality to translation quality. Paper in How2 workshop of ICML 2019.
- Worked on multimodal speech translation and found visual modality to offer limited help to rectifying Automatic Speech Translation inaccuracies. Showed that transcription noise (random) is harder to tackle than verb masking (deterministic) noise. Paper in IWSLT 2019.
- Obtained “Distinguished Project” status from the department.

## 🎓 EDUCATION

06/2023	PhD, Mathematics & Computer Science	Philips Research & University of Cagliari	Eindhoven, NL
11/2019	MSc, Advanced Computing	Imperial College London	London, UK
07/2018	BSc, Computer Science (joint degree)	University of Birmingham	Birmingham, UK
07/2018	BEng, Software Engineering (joint degree)	Sun Yat-sen University	Guangzhou, CN

## PUBLICATIONS

- **Zixiu, Wu**, Simone Balloccu, Rim Helaoui, Diego Reforgiato Recupero, Daniele Riboni. "Towards In-Context Non-Expert Evaluation of Reflection Generation for Counselling Conversations" *In Proceedings of the 2nd Workshop on Natural Language Generation, Evaluation, and Metrics (GEM) @ EMNLP 2022*. Dec 2022.
- **Zixiu, Wu**, Rim Helaoui, Diego Reforgiato Recupero, Daniele Riboni. "Towards Automated Counselling Decision-Making: Remarks on Therapist Action Forecasting on the AnnoMI Dataset" *In Proceedings of Interspeech 2022*. Sep 2022. Oral presentation.
- Vivek Kumar, Simone Balloccu, **Zixiu Wu**, Ehud Reiter, Rim Helaoui, Diego Reforgiato Recupero, Daniele Riboni. "Data Augmentation for Reliability and Fairness in Counselling Quality Classification" *In Proceedings of the IJCAI workshop on Scarce Data in Artificial Intelligence for Healthcare @ IJCAI 2022*. Jul 2022.
- **Zixiu, Wu**, Simone Balloccu, Vivek Kumar, Rim Helaoui, Ehud Reiter, Diego Reforgiato Recupero, Daniele Riboni. "AnnoMI: A Dataset of Expert-Annotated Counselling Dialogues" *In Proceedings of the 2022 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. May 2022. Oral presentation.
- **Zixiu, Wu**, Rim Helaoui, Diego Reforgiato Recupero, Daniele Riboni. "Towards Low-Resource Real-Time Assessment of Empathy in Counselling" *In Proceedings of the Seventh Workshop on Computational Linguistics and Clinical Psychology: Improving Access (CLPsych) @ NAACL 2021*. Jun 2021. Oral presentation.
- **Zixiu, Wu**, Rim Helaoui, Vivek Kumar, Diego Reforgiato Recupero, Daniele Riboni. "Towards Detecting Need for Empathetic Response in Motivational Interviewing" *In Companion Publication of the 2020 International Conference on Multimodal Interaction*. Oct 2020. Oral presentation.
- **Zixiu, Wu**, Ozan Caglayan, Julia Ive, Josiah Wang, Lucia Specia. "Transformer-based Cascaded Multimodal Speech Translation" *In Proceedings of the 16th International Conference on Spoken Language Translation (IWSLT) @ EMNLP 2019*. Nov 2019.
- **Zixiu Wu**. "Probing the Role of Video Context in Multimodal Machine Translation with Source Corruption" *In Imperial College London (Master's Thesis)*. Sep 2019. Awarded "Distinguished Project" by Department of Computing.
- **Zixiu Wu**, Julie Ive, Josiah Wang, Pranava Madhyastha, Lucia Specia. "Predicting Actions to Help Predict Translations" *In Proceedings of The How2 Challenge: New Tasks for Vision & Language @ ICML 2019*. Jun 2019.

## SKILLS

Research	Natural Language Understanding, Natural Language Generation, Conversational Intelligence, Knowledge Representation, Data Collection & Evaluation (e.g., crowdsourcing-based)
Data Science	<b>Python</b> (PyTorch, NumPy, Pandas, Scikit-learn, Keras among others), <b>Deep Learning, Machine Learning</b> , SQL (Postgres), JavaScript, HTML/CSS, Git, AWS, Unix
Soft Skills	Teamworking, Project Management, Public Speaking, Critical Thinking, AGILE, Value Creation Mindset, Effective Communication with Stakeholders
Languages	<b>English (C2)</b> , Chinese (Native), Dutch (A2 ~ B1), Italian (A2), Japanese (N3)

## OTHER WORK EXPERIENCE

### SOFTWARE ENGINEER INTERN

2018

#### Sabre Airline Solutions

 Shanghai, CN

- Developed programs for gathering, updating, and visualisation of flight, ticket-purchase, and gate-plan data, as a member of the Operations Research team.

### SUMMER INTERN

2017

#### GF Securities

 Nanjing, CN

- Conducted a feasibility report for an app feature predicting future stock trends using historical data.

## HONOURS & AWARDS

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2020-2022	Marie Skłodowska–Curie Grant - PhD Scholarship (European Union’s Horizon 2020 Programme)
2019	Distinguished Thesis Project (Imperial College London)
2017	International Student Scholarship (University of Birmingham)
2016	International Student Scholarship (University of Birmingham)
2016	Second Prize, China Undergraduate Mathematical Contest in Modelling (Guangdong Division)
2016	China National Scholarship
2016	First-Class Scholarship for Outstanding Student (Sun Yat-sen University)
2015	Second-Class Scholarship for Outstanding Student (Sun Yat-sen University)

## REFERENCES

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### **Ehud Reiter**

*Chair in Computing Science*

UNIVERSITY OF ABERDEEN

e.reiter@abdn.ac.uk

### **Aki Harma**

*Principal Scientist*

PHILIPS RESEARCH

aki.harma@philips.com

### **Julia Ive**

*Lecturer in Natural Language Processing*

QUEEN MARY UNIVERSITY

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### **Rim Helaoui**

*Data & AI Innovation Portfolio Lead*

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