Patrick Schrempf

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PUBLICATIONS

Schrempf P. et al. (2021) **Templated Text Synthesis for Expert-Guided Multi-Label Extraction from Radiology Reports.** In: Machine Learning and Knowledge Extraction. 2021; 3(2):299-317.

Schrempf P. et al. (2020) **Paying Per-Label Attention for Multi-label Extraction from Radiology Reports.** In: Interpretable and Annotation-Efficient Learning for Medical Image Computing. IMIMIC 2020, MIL3ID 2020, LABELS 2020. Lecture Notes in Computer Science, vol 12446. Springer, Cham.

Appelgren M. et al. (2019) **Language Transfer for Early Warning of Epidemics from Social Media.** In: AI+HADR 2019: Artificial Intelligence for Humanitarian Assistance and Disaster Response Workshop, NeurIPS 2019.

Falis M. et al. (2019) **Ontological Attention Ensembles for Capturing Semantic Concepts in ICD Code Prediction from Clinical Text.** In: Proceedings of the Tenth International Workshop on Health Text Mining and Information Analysis (LOUHI 2019), pp. 168-177.

Hui-Shyong Y. et al. (2016) **RadarCat: Radar Categorization for Input & Interaction**. In: Proceedings of the 29th Annual ACM Symposium on User Interface Software & Technology (UIST '16), pp. 833-841.

PATENTS

Schrempf, P., O'neil, A. and Watson, H., Canon Medical Systems Corp, 2022. **Text processing method and apparatus.** U.S. Patent Application 17/450,339.

Yeo, H.S., Quigley, A., Flamich, G., Schrempf, P. and Harris-Birtill, D., University of St Andrews, 2019. **Classification Method and Device.** U.S. Patent Application 16/490,338.

EDUCATION

EngD Computer Science
University of St Andrews, Scotland & **Canon Medical Research Europe,** Edinburgh

SEPTEMBER 2018 - AUGUST 2022

My research explores annotation-efficient learning in both medical text and imaging. The project is a collaboration between Canon Medical Research Europe and the University of St Andrews.

BSc Computer Science (First class)
University of St Andrews, Scotland

SEPTEMBER 2014 - JUNE 2018

During the first three years, I developed in Java, C, Python, JavaScript and Haskell. Some of my favourite modules include Data Encoding, Computational Complexity, Databases and Operating Systems. Currently, I am working on my dissertation on "Deep Learning for Cancer Segmentation" which has proven to be highly interesting.

Austrian Matura
AHS Theodor-Kramer Straße (Grammar School), Vienna

SEPTEMBER 2006 - JUNE 2013

Average Grade: 1.0 (Mathematics, Physics, English and German)

AWARDS

Best Paper Award - MICCAI LABELS 2020

08 October 2020, ONLINE

This award was received for the contribution entitled "Paying Per-label Attention for Multi-label Extraction from Radiology Reports".

John Honey Book Prize

2016/17, UNIVERSITY OF ST ANDREWS

The John Honey Book Prize is awarded to the best student in the Junior Honours class in Computer Science every year.

Deans' List

2014/15, 2015/16, 2016/17 & 2017/18, UNIVERSITY OF ST ANDREWS

The Deans' List is an annual award for academic excellence promoted by the Deans of the University.

EXPERIENCE

Research Engineer, Canon Medical Research Europe

AUGUST 2022 - PRESENT

As a permanent employee in the AI Research Team, my research focuses on medical NLP and how non-imaging data can be used to help in a clinical imaging workflow. I am involved in the full machine learning pipeline, from data acquisition and processing to training, evaluation and testing of AI models. A particular interest is learning with less data which is a vital area of research in the medical AI domain.

Laidlaw Internship in Leadership and Research, University of St Andrews

JUNE 2017 - AUGUST 2017 (10 weeks)

A scholarship awarded to 50 applicants in their penultimate year from all faculties across the university to work on a 10 week, self led research project. The topic of my research project was "Explainable Artificial Intelligence" - in particular attempting to explain the machine learning techniques used in RadarCat (see publications below). The result of the project was an interactive visualisation of the random forest classifier that can be combined with an already existing interface. Additionally, the scholarship involved various workshops and seminars that aimed to increase confidence in leadership and presentation skills. These workshops were affiliated with the Institute of Leadership and Management (ILM) and resulted in the award of an official ILM certificate.

J. P. Morgan, Glasgow — *Summer Technology Analyst*

JUNE 2016 - AUGUST 2016 (10 weeks)

Working on and improving the performance of a strategic internal application by implementing database caching. The application was built using the Spring framework in Java and relied on a variety of Application Programming Interfaces. I led the project with the support of four other software developers and business analysts. The outcome was a significantly faster loading time of the application in Europe and Asia.

Google ATAP Project Soli, University of St Andrews — *Soli Alpha Developer*

JANUARY 2016 - JULY 2016 (7 months)

This internship involved researching and developing a novel application as part of the St Andrews Computer Human Interaction Group (SACHI). It started as a four week internship working alongside a PhD student and experimenting with the new Google Soli radar sensor. During these four weeks I linked the radar input to a machine learning library and experimented with different models of machine learning. I helped run experiments to explore what objects our system could classify using the radar signal. After these four weeks, further experiments and research resulted in a publication ("RadarCat: Radar Categorization for Input & Interaction"). Furthermore, we were one of ten groups out of fifty to be selected to present our work at Google in California.

School of Medicine, University of St Andrews — *Research Assistant*

FEBRUARY 2016 - JUNE 2016 (5 months)

As part of a larger research project looking at the effect of genes on handedness and laterality, the School of Medicine started a project to digitalise the simple pegboard test. This test involves moving pegs from a row of small holes at the top of a board to a row of holes at the bottom of a board. Another undergraduate student and I developed the digital version of the test. In addition to the Android application that was developed, we had to create the hardware by 3D-printing conductive pegs and laser cutting custom frames. The digital pegboard test is now being tested in various research centres around the world.

Austria Press Agency - IT, Vienna — *Web development intern*

JULY 2015 - AUGUST 2015 (2 months)

During this internship, I independently developed a WordPress plugin for internal use within the Austrian Press Agency. This plugin automatically suggests annotations while reporters are editing their articles within Wordpress. The annotation system already existed, however this project integrated it into a plugin that is easy to use for all employees. During this project, I developed new skills in PHP and JavaScript in order to fulfil the requirements.

Austrian Red Cross, Vienna — *Paramedic*

DECEMBER 2013 - AUGUST 2014 (9 months)

As part of the Austrian compulsory community service, I worked as a paramedic for the Austrian Red Cross for 9 months. This included a month of paramedic training and eight months of working in an ambulance. In the ambulance, I was responsible for patient wellbeing and communication with hospitals in emergencies.

INTERESTS

Cycling Champion, Canon Medical Research Europe

2023 - PRESENT

As a cycling friendly employer, Canon Medical Research Europe appointed me as their first “cycling champion” in January 2023. This position involves engagement within the employee cyclist community and creating information guides for employees (e.g. a guide to safe cycling, bike maintenance, etc.).

Company Librarian, Canon Medical Research Europe

2018 - PRESENT

During my time as an EngD student, I took on the role as company librarian at Canon Medical Research Europe. The physical library is maintained regularly and added to throughout the year. During the pandemic this resource became unavailable for most employees and students, so I started a digital library for the company, making it possible to find and access relevant literature online through the

company portal. I have continued this position during my permanent employment with Canon.

Level 1 Triathlon Coach, British Triathlon

2018 - PRESENT

I qualified as a level 1 triathlon coach for British Triathlon with the Edinburgh University Triathlon Club in 2018. Since then, I have moved to coach the Durham Triathlon Club which has been a very rewarding experience as it has enabled me to work together with many other coaches and athletes from a variety of backgrounds.

Executive Committee, St Andrews Computing Society

2015/16 & 2016/17

During my time on the executive committee for STACS (St Andrews Computing Society), I helped organise three hackathons with 100+ participating students. My main role during organisation of the events was to contact sponsors in order to make the events free to all participating students. As well as these larger events, we (the committee) hosted a variety of other smaller talks and workshops throughout the year.

Club president, University of St Andrews Triathlon Club

2017/18

As club president, I was in charge of the club and the committee. This role mainly involved liaising with the Athletic Union of the University, our triathlon coach and with the national governing body Triathlon Scotland. In addition, I oversaw and helped with the race organisation of our two annual races - an Autumn Duathlon and a Spring Triathlon. These races attract around 100 local competitors from Fife and other universities in Scotland.

IT representative, University of St Andrews Charities Campaign - Race2

2017/18

As the IT representative, I was in charge of the tracking software and website for the Charities Campaign's "Race2" event. This event is a hitchhike starting in St Andrews and ending in a different European city every year. With 50 teams of two to three participants, it is very important to have reliable software that enables simple tracking of the teams in order to ensure their safety. In addition, the website provides a platform for sharing each team's success and raising money. The successful running of the website enabled the campaign to raise over £30,000 for charity.