

WP 6 – Climate Action: Making Data Widely Available

Who are we?

- Maria Erman @ AFRY (maria.erman@afry.com)
 - Areas of expertise: Machine learning and artificial intelligence, signal processing, telecommunications
- Carl Sundström @ AFRY (carl.sundstrom@afry.com)
 - Areas of expertise: Engineering, scientific computing, numerical models, simulations and optimization
- Tomas Gustafsson @ AFRY (tomas.c.gustafsson@afry.com)
 - Areas of expertise: New innovation, radio communications, UAV, defence and security



Aim/Tasks and Deliverables of WP 6

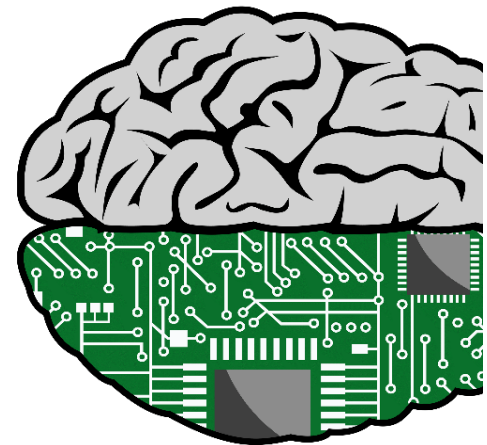
- Increase awareness of machine learning (ML) and artificial intelligence (AI) and how to use the technology
- Pre-study on inquiries and needs from research stations, to identify datasets and questions to be answered
- Exploring applications of machine learning, using researchers' and station data, making algorithms and methods available and demonstrate the outcome
- Future strategies for AI and ML, and ensuring access to relevant data



(Credit: Mikko Jokinen)

Progress

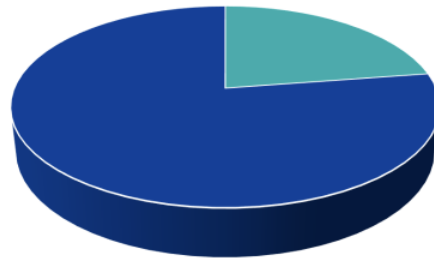
- Deliverable 6.4 reached
 - Final report, summarising the work undertaken in WP6
 - Previous reports
 - Master thesis work
 - Future strategy for the area of AI and ML to be applied in Arctic research
- Milestone 6.3 reached
 - Making available reports, theses, code repositories
- → All deliverables and milestones reached for WP6



(Source: <https://pngflow.com>)

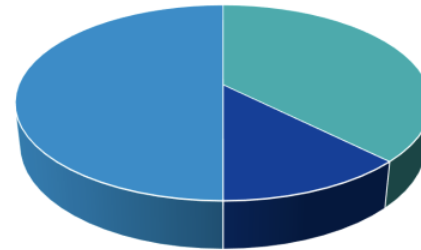
Results given the responses from the Pre-study D6.1

Do you currently use AI?



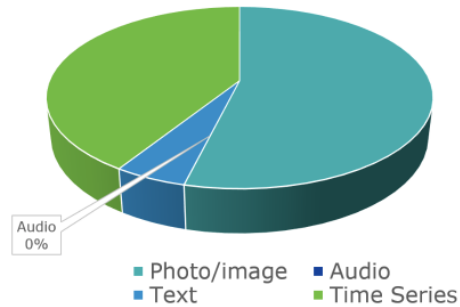
■ Yes ■ No

Do you plan to use AI in the future?



■ Yes ■ No ■ Maybe

Type of data accessible from stations



*Statistics collected from survey and interviews



Summary of Master Theses Undertaken

- Fredrik Örn in collaboration with The Cairngorm Station, with Jan Dick and Christopher Andrews:
 - Computer vision project. Detection and classification of animals.
- Maja Linderholm on cutting edge natural language processing on archived logbooks from the Tarfala Station
- "Deep Learning for Iceberg Detection in Satellite Images" by Shuzhi Dong
- "Image Augmentation to Create Lower Quality Images for Training a YOLOv4 Object Detection Model" by Tim Melcherson
- "Searching and Recommending Texts Related to Climate Change" by Karolin Gjöthlén



D6.4 – Future Strategies for AI and ML

- Experts rely on open-source tools, packages, models, and programming languages
- Ready made commercial solutions
- Pre-requisites to using ML, knowledge on how to handle data sets
- Example of methodology for creating an initial PoC:
 - List resource consuming and manual tasks
 - Consult a data science/ML engineer expert
 - Hire master thesis students from IT or data engineering/science to setup a PoC
 - Students presenting their work with a focus on learning outcomes and future development
 - Evaluation of what went well, what can be improved on, and whether the PoC can assist in Arctic research

Ways Forward

- While WP6 is finished, we see further work on data engineering
 - Preparation of data
 - Harmonising the way stations make their data available
 - -> To more easily perform data analysis and apply AI/ML techniques
- Ideas you may have on any new innovation and technology project to develop
- For discussions on anything AI/ML and drone related, you are welcome to contact either of us:
maria.erman@afry.com
carl.sundstrom@afry.com
tomas.c.gustafsson@afry.com

