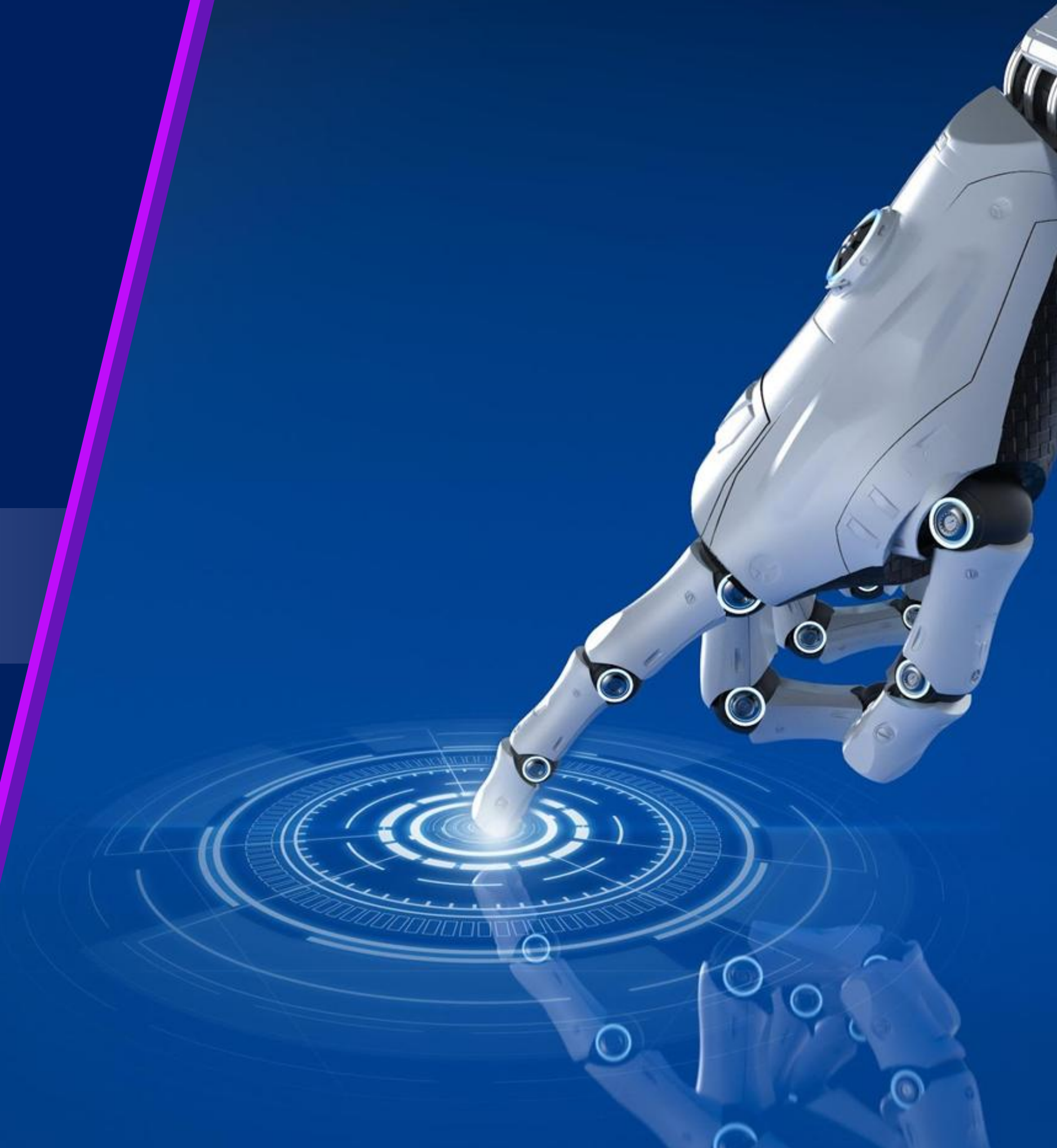
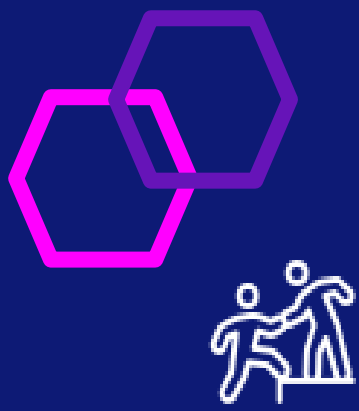




AI Training Bootcamps

Glen Charlton Lead Data Scientist

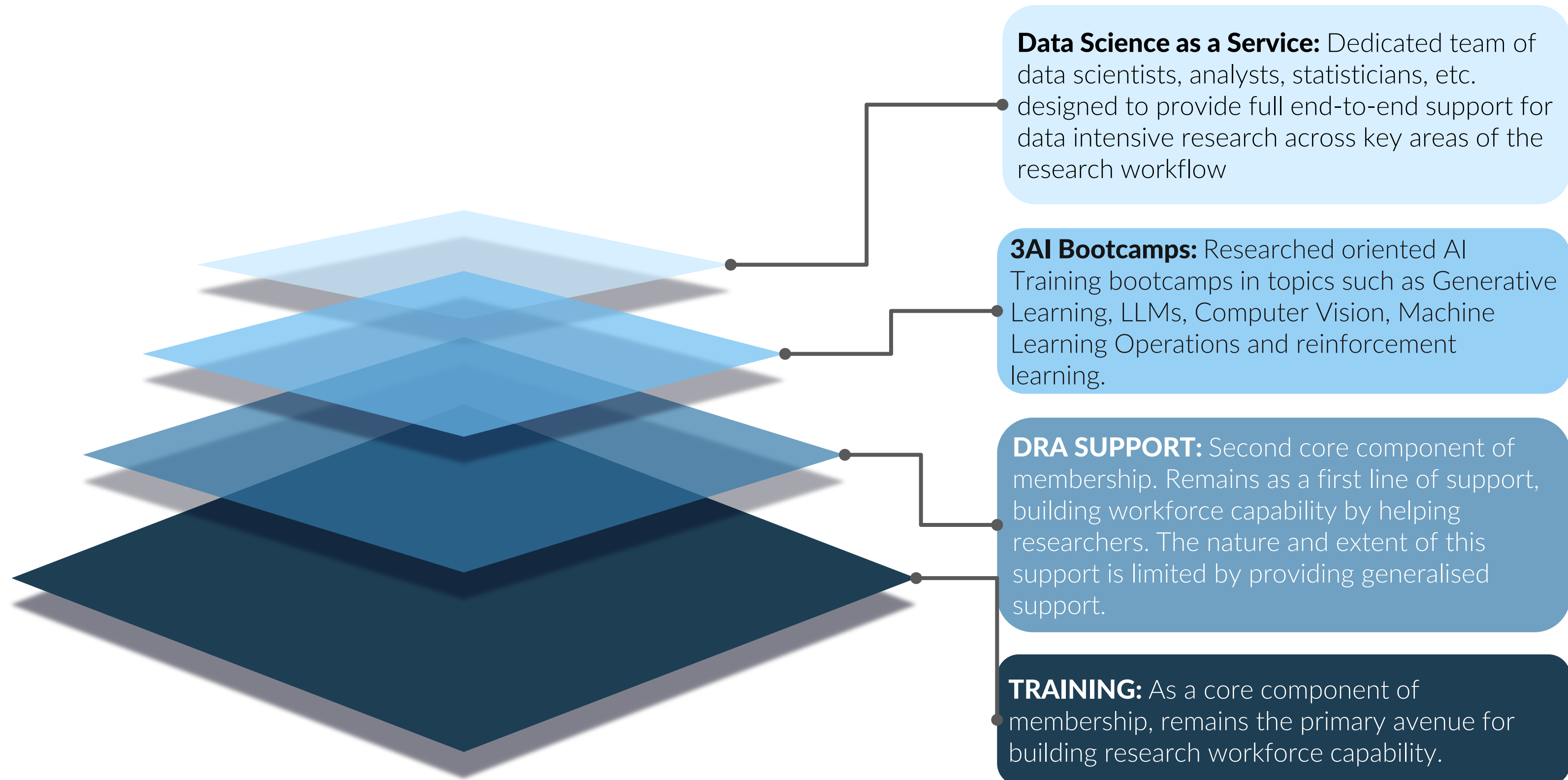




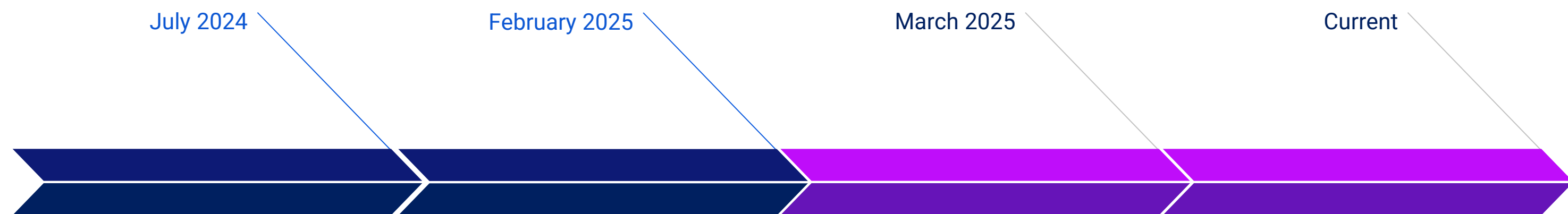
The purpose



:: Layers of Research Support



:: Project Timeline



Ideation

3AI and wider Intersect team identified the gap for researchers and begun to develop training content.

Developed

The idea and concept was developed and the development of the application was started.

Launched

The first delivery of the AI Training Bootcamps at NSW Department of Climate Change, Energy, the Environment and Water

Continued delivery and development

Currently delivering an AI bootcamp with participants from WSU, SCU, LTU and UoA.

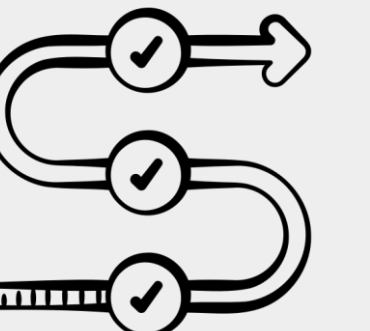
:: The team



3AI is a team of research-oriented data scientists and AI experts from diverse research backgrounds.



We aim to advance research by leveraging data science and AI methods combined with digital tools, technologies, and infrastructure.



We provide full end-to-end hands-on support for data-intensive research.



:: For researchers by researchers



:: 3AI Training Bootcamp

Upskill your research workforce with our specialised AI Training Bootcamps led by Research Data Scientists

A.

Research-Oriented

Designed and led by individuals with a background in research

B.

Research-Relevant

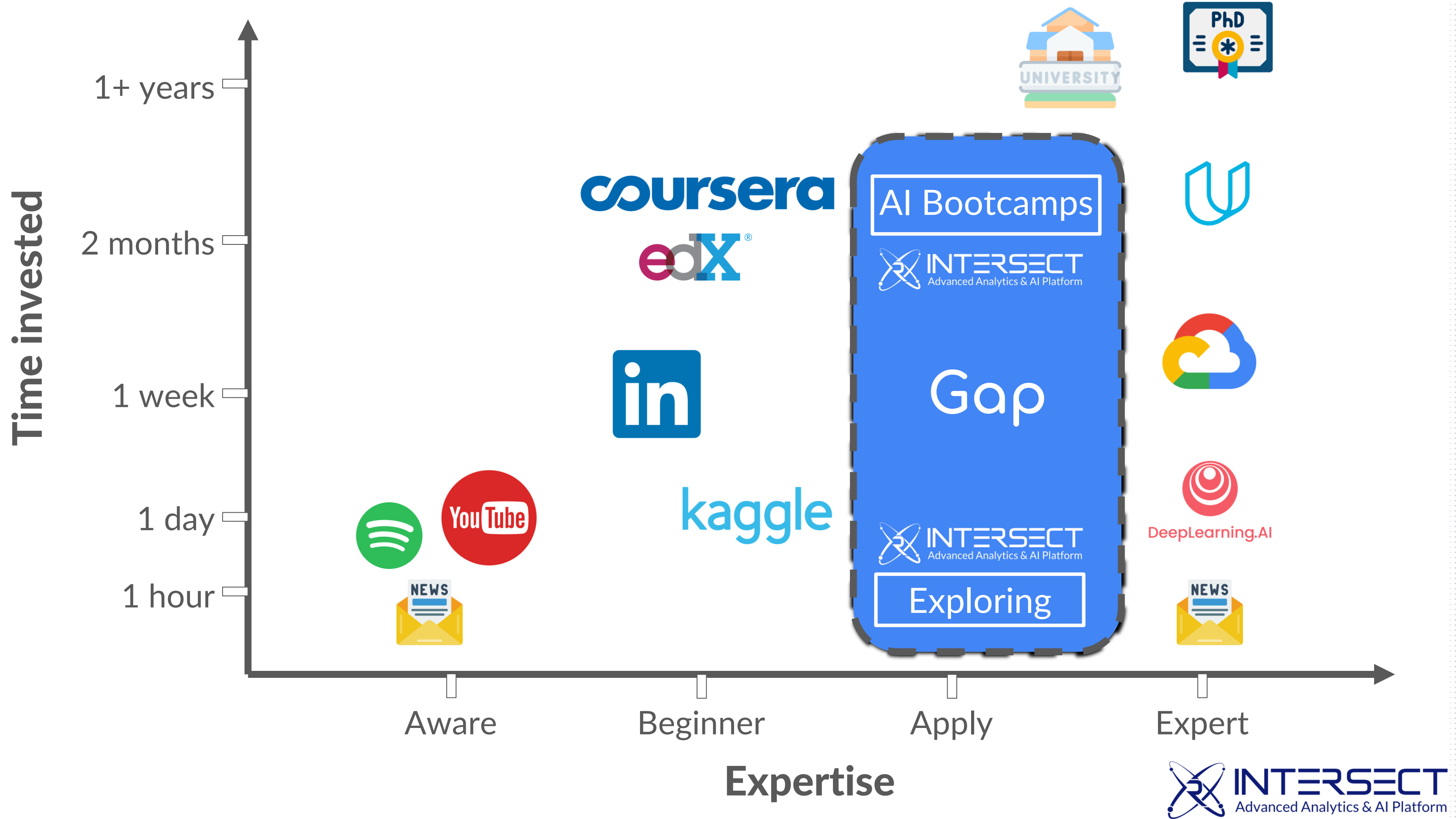
The topics covered are directly applicable to research contexts

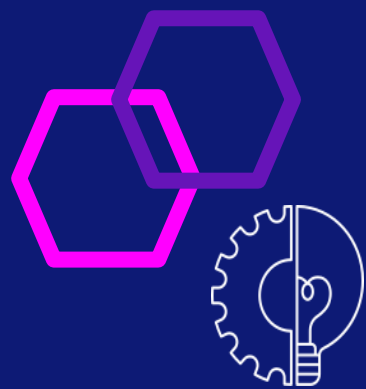
C.

Research-Focused

Strong emphasis on research applications and methodologies

:: 3AI Training Bootcamp





















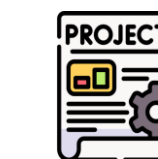











What are the
bootcamps?



:: 3AI Training Bootcamp

Week 0	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Getting started - Course Guide	 <p>Pre-reading</p>	 <p>Pre-reading</p>	 <p>Pre-reading</p>	 <p>Pre-reading</p>	 <p>Pre-reading</p>	 <p>Pre-reading</p>	 <p>Pre-reading</p>
	 <p>Hands-on live instructor-led delivery</p>	 <p>Hands-on live instructor-led delivery</p>	 <p>Hands-on live instructor-led delivery</p>	 <p>Hands-on live instructor-led delivery</p>	 <p>Hands-on live instructor-led delivery</p>	 <p>Hands-on live instructor-led delivery</p>	 <p>Hands-on live instructor-led delivery</p>
	 <p>Project work</p>	 <p>Project work</p>	 <p>Project work</p>	 <p>Project work</p>	 <p>Project work</p>	 <p>Project work</p>	 <p>Project work</p>
	 <p>Exercises / Quizzes</p>	 <p>Exercises / Quizzes</p>	 <p>Exercises / Quizzes</p>	 <p>Exercises / Quizzes</p>	 <p>Exercises / Quizzes</p>	 <p>Exercises / Quizzes</p>	 <p>Exercises / Quizzes</p>

:: Learning Management System

HELPING RESEARCHERS PURSUE A BETTER FUTURE

INTERSECT

Intersect Training Categories Courses What to expect FAQs

Welcome to Intersect Australia Digital Research Training Programs

Intersect's mission is to help researchers to be more efficient and effective in their research; reducing the time to move from an idea to a tested solution. Intersect provides an extensive range of technology-focused training to researchers and higher degree research (HDR) students across Australia, covering the breadth of research-relevant digital tools, technologies, and methods. The training is delivered by Intersect's team of experts.

WELCOME TO INTERSECT AUSTRALIA DIGITAL RESEARCH TRAINING PROGRAMS

www.intersect.edu.au

AI Training Bootcamps - Generative AI and Large Language Models

Course type: Short course
Credential type: Certificate of completion
Start date: Start any time
Duration: Approx 1.5-2 days a week for 7-8 weeks

JOINED

Join this AI Training Bootcamp to learn more about how to use Generative AI and Large Language Models

Dive into the world of Generative AI and Large Language Models in this comprehensive bootcamp designed for researchers eager to harness the power of cutting-edge AI technologies. Over the course of 7-8 weeks, participants will explore the principles and techniques behind generative models like GPT, focusing on their applications in text generation, content creation, and more. Through hands-on, instructor-led sessions, participants will learn how to implement, fine-tune, and deploy LLMs in real-world research scenarios. The bootcamp also includes pre and post-reading materials, and a collaborative team project, allowing participants to apply their skills in a practical setting and gain insights into the ethical considerations and challenges of working with advanced AI models. By the end of the bootcamp, researchers will be equipped with the knowledge and tools to integrate Generative AI and LLMs into their projects, driving innovation and enhancing their research outcomes.

Modules:

- Module 1:
 - Intro to Natural Language Processing (NLP)
 - Intro to Large Language Models (LLMs)
- Module 2:
 - Data import, cleaning, and preprocessing
- Module 3:
 - Training LLMs

WELCOME TO INTERSECT AUSTRALIA DIGITAL RESEARCH TRAINING PROGRAMS

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:: Web-based Coding Environment

The screenshot displays a web-based JupyterLab interface. The browser address bar shows the URL: `genai1.ai-training-bootcamps.cloud.edu.au/jupyter/lab/tree/module2/student_notebooks/module2_text_pro...`. The JupyterLab interface includes a menu bar (File, Edit, View, Run, Kernel, Tabs, Settings, Help) and a file browser on the left. The file browser shows a directory structure: `/ module2 / student_notebooks /` with a table of files:

Name	Modified
module2_embed...	33m ago
module2_text_pr...	33m ago

The main notebook area is titled `module2_text_processing_` and is in `Markdown` mode. The content of the notebook is as follows:

Module 2: Introduction on Text Processing - Cleaning and Analysis

Learning Objectives:

Basic Cleaning and Preprocessing

- Define text preprocessing techniques
- Recognize the scenarios in which to apply text techniques.
- Acquire hands-on experience with text pre-processing techniques (ETL)

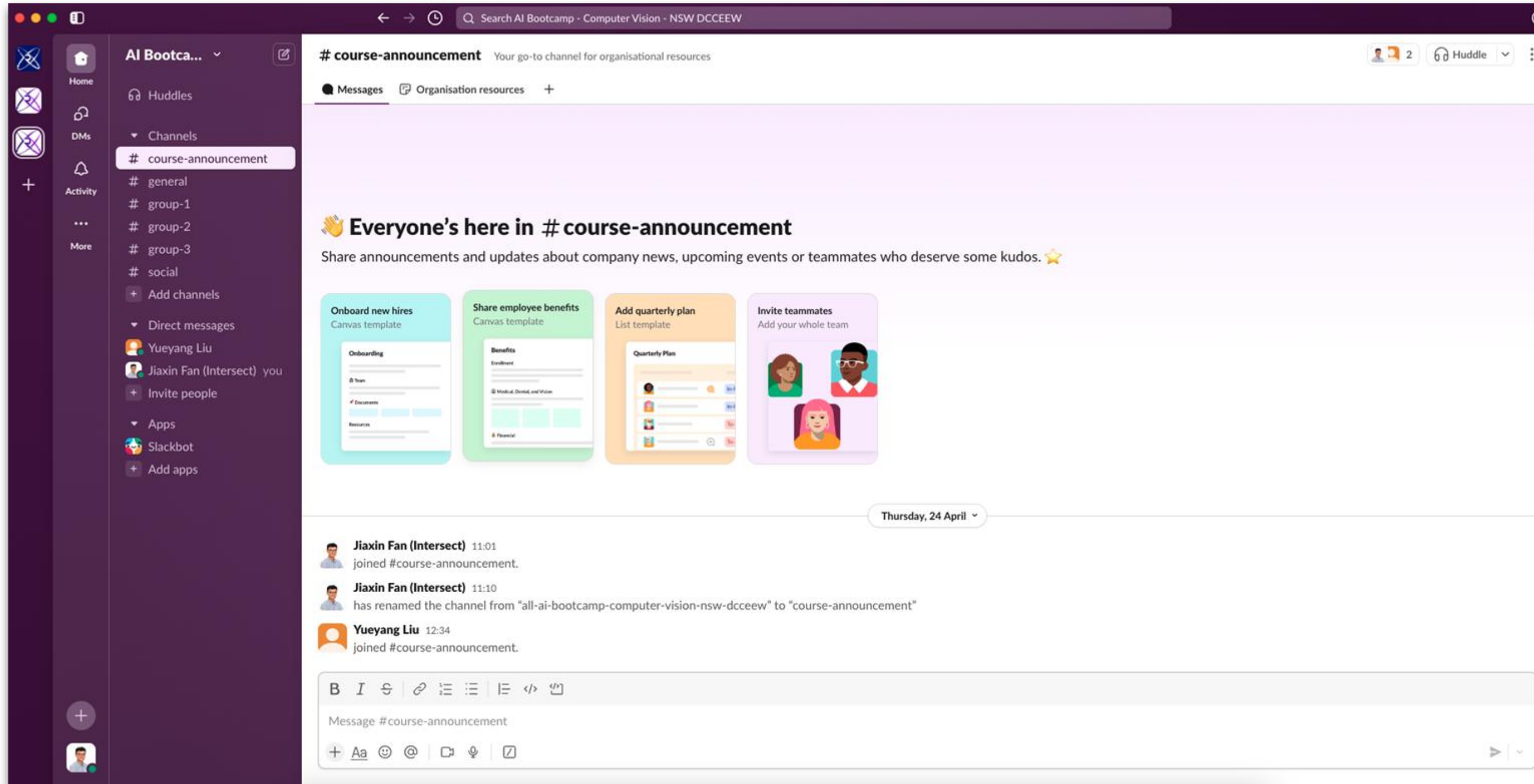
Basic Text Analysis

- Generate and interpret word clouds to visualize the most frequent words in a text corpus.
- Perform sentiment analysis to determine the emotional tone of text data.
- Utilize various metrics to analyze the distribution and frequency of words in text data.

Scenario: Evaluating an SMS Spam Detection Algorithm

The status bar at the bottom indicates: `Simple` (toggle), `0` (lines), `1` (column), `Python 3 (ipykernel) | Connecting`, `Mode: Command`, `Ln 1, Col 1`, `module2_text_processing_student.ipynb`, and `1` (line number).

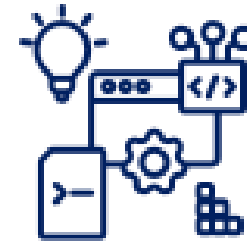
:: Collaborative Communication



:: Generative AI and Large Language Models

In this course, we challenge you to think critically about how these cutting-edge technologies can be applied to advance your work. How will you harness their potential to solve complex problems, unlock new insights, and drive the next wave of breakthroughs?

Through hands-on instructor-led workshops, exercises and quizzes, real-world case studies, and discussions, you'll dive into the practical applications of Generative AI and LLMs.



Learning Outcomes

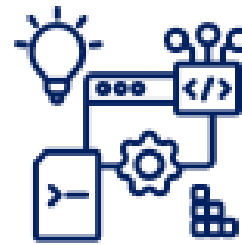
- **Concepts of Natural Language Processing (NLP):** Gain a basic understanding of NLP and its applications, and comprehend the fundamentals of Generative AI and LLMs.
- **Text Processing:** Acquire hands-on experience with text data, understand text preprocessing techniques, and prepare data for modelling, including a prompt use case.
- **Training Language Models:** Train a simple NLP model for various tasks, discuss computational challenges during pre-training, and improve performance through fine-tuning with prompt datasets.
- **Model Evaluation and Interpretation:** Evaluate and interpret model results, and learn to deploy models in other applications via APIs.
- **Limitations of GenAI and LLMs:** Understand the limitations of generative AI and learn responsible AI practices.

Explore the transformative power of GenAI and LLMs in reshaping research and innovation

:: Computer Vision

This course offers an immersive learning experience that blends hands-on practice with essential theories, providing a solid foundation in Computer Vision.

You'll explore machine learning, deep learning, object detection, image segmentation, and generative AI. Along the way, you'll develop strong problem-solving skills and gain deep expertise, preparing you to understand and address complex research questions.



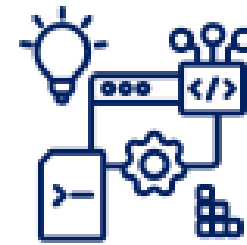
Learning Outcomes

- **Fundamentals of Computer Vision:** Understand the scope and current development of computer vision.
- **Image Processing:** Apply knowledge of computer vision to process imagery data and extract features.
- **Building Convolutional Neural Networks (CNNs):** Understand the basic concepts and code your own CNNs.
- **Object Detection and Image Segmentation:** Acquire hands-on experience with Object Detection and Image Segmentation, and successfully apply models to a realistic problem.
- **Generative Models:** Communicate an understanding of Generative Model and how it can be applied to Computer Vision.
- **Model Evaluation and Interpretation:** Critically evaluate and interpret Computer Vision approaches to apply to their applications.

Equipping researchers with knowledge and hands-on practice in Computer Vision

:: Machine Learning Operations (MLOps)

Managing machine learning experiments is complex and time-consuming. The MLOps course streamlines workflows and optimizes the ML lifecycle. Hands-on MLflow experience enables efficient experiment tracking and automation. The course enhances reproducibility, scalability, and collaboration in ML development.



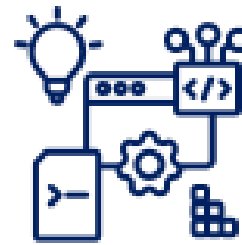
Learning Outcomes

- **Benefits of MLOps:** Communicate a clear understanding of the benefits of applying ML operations.
- **Applying Experiment Tracking:** Apply knowledge of ML experiment tracking using MLflow to perform model evaluation and hyper parameter tuning.
- **Managing MLflow Project:** Acquire hands-on experience with modular ML scripts to successfully execute an MLflow project
- **Designing End-to-end Pipeline:** Apply the concepts of ML operations to develop an End-to-End ML pipeline.
- **Managing through the ML Lifecycle:** Critically evaluate and interpret the ML model life cycle via iterating the model building and tracking.

Helping researchers to apply the concepts of MLOps in managing and tracking machine learning experiments

:: Reinforcement Learning

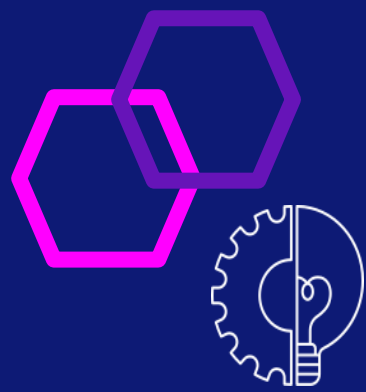
The bootcamp explores reinforcement learning for solving complex problems. Participants enhance skills to optimize decisions and develop intelligent systems. Workshops, case studies, and discussions provide practical real-world implementation skills.



Learning Outcomes

- **Reinforcement Learning (RL) Fundamentals:** Communicate an understanding of the fundamental concepts and principles in Reinforcement Learning
- **Applying RL algorithms:** Apply various value-based Reinforcement Learning algorithms, and develop an understanding of their applicability, strengths and weaknesses.
- **Use of Neural Network in RL:** Understand and apply Deep Reinforcement Learning techniques, including the use of neural network function approximators.
- **Policy-based Methods:** Develop an understanding of policy gradients and apply key policy-based methods in Reinforcement Learning.
- **Performance Optimisation:** Apply state-of-the-art techniques to optimize the performance of Reinforcement Learning.
- **Case Studies:** Apply state-of-the-art techniques to optimize the performance of Reinforcement Learning.

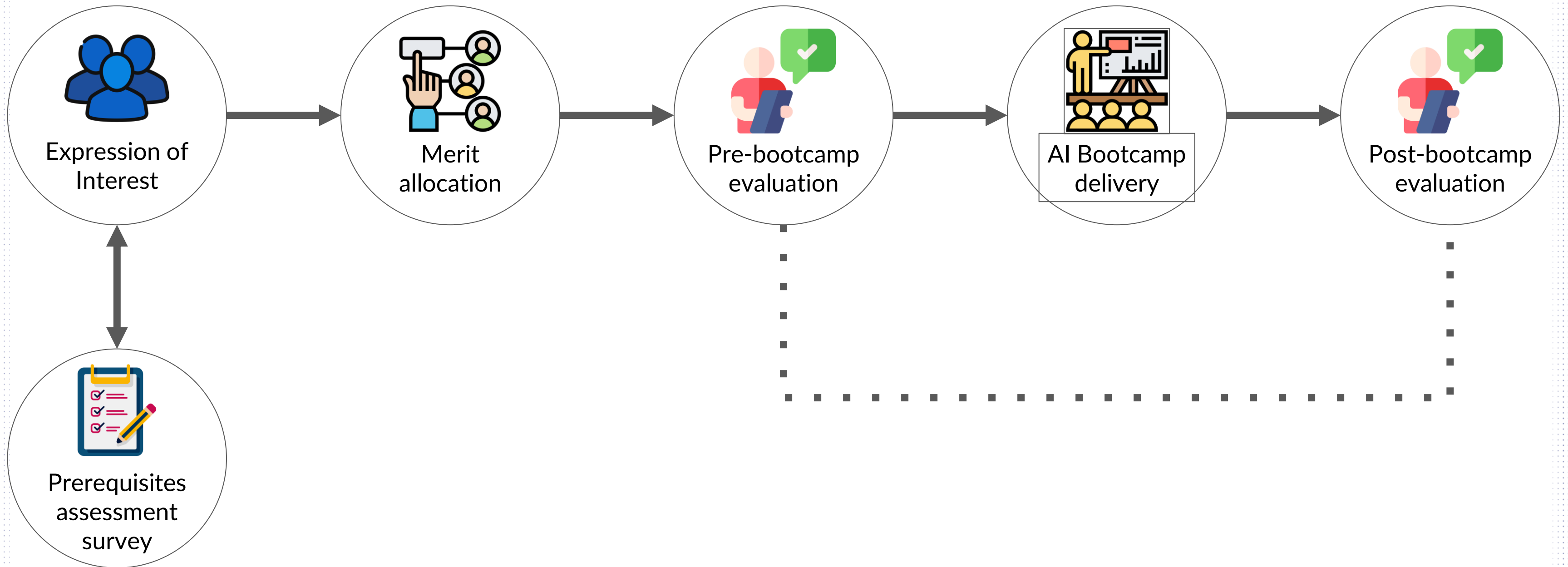
Helping researchers unlock the potential of reinforcement learning within a research context






The results to date



:: Data Collection Process



:: 3AI Training Bootcamp: Results

Attendance Rate:	Net Promoter Score:	Understanding of AI topic:
 90%	 +52	 ~50%

Attendees' feedback:

"I really appreciated the holistic approach of the bootcamp – it covered a wide range of topics, striking a great balance between theory and hands-on practice."

"The quality of the resources provided was excellent and will be incredibly helpful for continuing the learning journey independently."

"[The bootcamp] felt well-structured and empowering, all delivered in a genuinely supportive and friendly environment."

:: 3AI Training Bootcamp: What is next?

Actively updating the content while listening to community feedback

Engagement

More activities to keep attendees engaged with the instructors and among themselves.

Improvement

Observe while delivering and iteratively improve the content for both theory and practice.

Update

Update the content to keep up with the latest trend and knowledge.



A special thank you to those who contributed to this work:

Anastasios Papaioannou, Echo Zhou, Ghulam Murtaza,

Long Le, Jiaxin Fan, Yueyang Liu

