TeleMARS

Training Opportunity
Network Data Analysis for AI Transformation

Version 1.0

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BACKGROUND

TeleMARS is a Brisbane based ICT business focusing on Data Analytics, Artificial Intelligence (AI), Big Data and Process Automation. The team has developed Artificial Intelligent solutions applying various mathematics methodologies including machine learning algorithms to resolve real-world problems, such as the detection of network traffic anomalies.

Recently TeleMARS was selected as a panel supplier of ICT Research and Analysis Services to Queensland governments. Meanwhile we partner with RMIT University to jointly work on research and training programs in the disciplines of AI; Cloud, System & Security; and Data Science.

PREVIOUS PROJECT

TeleMARS conducted a research and development (R&D) project "Experiment and improve reinforcement learning algorithms to enhance anomalous network behaviour detection" in 2021 which was supported by ISIF Asia grant.

The findings suggested that machine learning algorithms are capable of detecting cyber-attacks including emerging attacks. However, the effectiveness of machine learning detection models is impacted by specific network environments. The models need to be adjusted in accordance with different network topologies, architecture and configuration.

The lessons learnt also recommended the development of effective AI solutions requires a number of prerequisites to be in place, including comprehensive and clean real network data, accurate interpretation of network data, and suitable construction of network data for a target problem.

In order to leverage the power of machine learning algorithms, network data needs to be transformed accurately without losing any original information of network traffic and behaviours. This process requires joint effort between the network subject matter experts and data scientists.

MOTIVATION

Network technologies, devices and architecture are changing rapidly in recent years, the complexity of network management and monitoring increases dramatically. As the global pandemic continues, organizations are struggling more than ever to manage competing network resources, growing user demands, complex troubleshooting challenges, new digital transformation initiatives and technologies, and more. IT directors are doubling their efforts to find effective ways to improve the network while reducing operational costs. The AI for IT Operations (AIOps) concept and approach, which combines big data and machine learning to automate IT operations processes, has emerged with promising potential to resolve the challenges.

To be ready for the successful implementation of AIOps, organisations need to equip their workforce with right knowledge and skills. These includes analysing live or historical real network datasets to monitor network traffic, troubleshoot, measure performance, and detect cyber-attacks.

TeleMARS initiated a training project to promote the up-to-date knowledge and skills in network data analysis. It also provides a new format of collaboration between the professionals in network operations and data science disciplines. This project is supported by ISIF Asia Grant - APINIC Foundation.

PROJECT OVERVIEW

TARGET TRAINEES

The target trainees are the Network Operations professionals including network engineers, support engineers, system engineers, security engineers, and/or account managers.

We are open to other roles who would like to learn and improve their skills in the subjects of network data analysis.

The capacity of the proposed training project is up to 30 trainees.

The registration of Expression of Interest (EOI) and participation is open to anyone who is working in Network Operations profession. Information validation will be conducted to confirm the enrolment of this training project.

SUBJECTS

The proposed training subjects are outlined below for your reference.
1. Introduction of Network Data
   a. This includes data definitions, types of network data (cloud, web, Internet, IoT, protocols, Switch, Route/Link, etc.), data structure, file formats, etc.
2. Introduction of Network traffic analysis
   a. Network traffic analysis includes network performance measures, identifying bottlenecks, troubleshooting bandwidth issues, detecting cyber-attacks, etc.
3. Basic network data analysis processes and methods, such data cleansing, sampling, normalisation, flow generation, feature development etc.
4. Introduction of applying AI models to detect network traffic anomalies
   a. This includes the mechanism of machine learning models, implementation environment, data preparation, etc.

We are open to any suggestions. A survey form is available [here](#) for you to express your interest and provide feedback. This form aims to interact with Network Operations community to understand what training subjects or knowledge areas are most needed. We will tailor the training courses to satisfy the needs and provide better values.

TRAINING ACTIVITIES

The proposed activities include the following:
- Professional workshops on specific subjects.
  - The workshops will be delivered online through Teams.
  - The videos of the workshops will be available to the registered trainees.
- Practice of the analysis skills on a cloud-based platform on real network datasets.
- Collaboration with data scientists and data engineers.
- Peer review and discussions.

We are open to any feedback and suggestions on what training activities are effective.

KEY PHASES AND TIMELINE

Timeframe	Phase	Outcome
February – March 2022	EOI registration and feedback	Confirm the enrolment
March – April 2022	Discussions	Confirm the subject details

May – June 2022	Course details and schedule confirmation	All course materials and schedules are ready
July – September 2022	Course delivery and practice	Improvements in knowledge and skills
August – November 2022	Retrospective and discussions	Lessons learnt and future plan

ACTIONS

STEP 1

If you have interest in this training opportunity, please click here to complete the survey form.
We will get in touch with you very soon.
Once the basic information is validated, the training enrolment will be completed.

STEP 2

A training team will be created on Teams including all the enrolled trainees.
According to the feedback, discussions will be held through the team posts.
General information will be shared in the team File or WIKI areas.

STEP 3

TeleMARS and the experts from RMIT will work together to incorporate the feedback and discussions into course details.
The course plan and schedule will be published to the enrolled trainees.

STEP 4

Training workshops will be delivered online as scheduled.
The enrolled trainees will be authorised with access to a cloud-based platform to practise analysis on real network datasets.
The analysis work can be shared on the platform to receive peer reviews. Any data processing or modeling work is supported by data scientists and data engineers.

STEP 5

Retrospective and discussion sessions will be conducted in accordance with the training and practice progress. Any feedback on course delivery or contents from the trainees will be collected and reviewed to make changes and improvements. The lessons learnt and the recommendations on the next stage training program will be discussed. The learning outcomes of this training project will be assessed based on the results and the discussions.