

Garching, Aug 30, 2022

Confirmation of participation in TUM Data Innovation Lab (TUM-DI-LAB)

To whom it may concern,

TUM Data Innovation Lab (TUM-DI-LAB) is an educational research experience offered by the Munich Data Science Institute (Technical University of Munich) that welcomes master students interested in exploring new data-driven approaches to interdisciplinary challenges. The successful participation in TUM-DI-LAB corresponds to a module with 10 ECTS-Credits.

Hereby I confirm that the student **Runyao Yu** successfully participated in summer 2022 in the project „Prediction and Clustering Critical Suppliers“ offered in cooperation with BMW Group, obtaining a final grade of 1.3 (very good). Tasks in which Runyao Yu was involved:

- Exploratory Data Analysis (EDA) for Event Data Understanding
- NLP Embedding Training, Clustering and Knowledge Management applying TF-IDF, Mini-Batch K-Means and Statistical Methods for Event Data
- Anomaly Detection and Validation for Binary and Multiclass classification using Isolation Forest
- Data Balancing applying Deep Generative Model CTGAN and Random Over-/Undersampling
- Escalation Level Classifier Training utilizing XGBoost and Random Forest with Grid Search for Binary and Multiclass Classification
- Advanced Visualization for High Dimensional Data utilizing PCA, UMAP, and T-SNE for Validating Latent Pattern for Classification and NLP Clustering
- Documentation Support (PowerPoint Creation and Report Writing)

Visit our webpage to have more information about the prroject and its results:

<https://www.mdsi.tum.de/di-lab>

With kind regards,



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