BACKGROUND

Sector	Infocomm Technology (ICT)
Industry Overview *(Brief description of the sector)*	The Infocomm Technology (ICT) sector continues to play a key role in Singapore's economic development. According to the IMDA's Annual Survey on Infocomm Media Manpower for 2019, the number of ICT professionals employed grew by 8,100 (4.3%) from 2017 to reach 197,500 in 2018. Together with 18,700 Infocomm job vacancies, total demand of Infocomm professionals increased by 6.7% from 2017 to reach 216,200 in 2018. Demand for Infocomm professionals is projected to grow by another 61,600 in the next 3 years (2019 – 2021). Singapore is poised to become the world's first Smart Nation which aims to develop Singapore's capabilities in pervasive connectivity, and build new infrastructure and common technical architecture to enable citizens, businesses and government agencies to leverage technology to make lives better. This initiative would increase the demand for ICT professionals in the areas of Software and Applications, Network and Infrastructure and Critical Emerging Technology (such as Business Analytics and Cyber Security).

JOB DETAILS

Job Title *(Upon Completion Of Programme)*	AI Solutions Architect
Nature Of Job	- Design software components and modules - Develop and use simulation and prototypes to evaluate software design quality in text analytics - Present data and AI model development outcomes to key stakeholders - Conduct extraction and integration of data including features from different data sources - Develop multiple text models and algorithms suitable for the use case using multi class classification algorithms - Perform model comparison for all the multi classes to draw inferences on variable importance - Select the best model based on pre-defined evaluation criteria using confusion matrix - Create multiple views of the software system and design high-level organisation of a software system

	- Conduct extraction and integration of data including features from different data sources - Develop multiple models and algorithms suitable for the use case - Develop regression - models, including linear, multiple and logistic regression models - Perform Machine Learning Activities and Propose solutions and recommendations - Develop mathematical models to isolate trends - Analyse data using IRAC method identify trends, patterns and correlations to support decision-making in predictive maintenance project - Formulate and implement strategies to identify, acquire and use appropriate data and AI models - Present insights of data and AI model to key stakeholders - Interpret and evaluate model performance for scaling and deployment
Monthly Gross Salary	$4,000* *Starting salary will differ with skills, experience and qualifications.*
Job Requirements	NA

COURSE DETAILS

Programme Name	**PCP for AI Solutions Developer**
Programme Overview	Lithan's NICF-Diploma in Infocomm Technology (Data) course aims at providing career centric qualifications to IT professionals who would like to embark on AI Learners will be able to gain fundamental knowledge and skills required to Python Machine Learning programming, statistical modelling, Azure Machine Learning models in Jupyter Notebook, Deep Learning and Natural Language processing (NLP) to define the next generation of Artificial Intelligent solutions and making inferences from knowledge. Module 1: Introduction to Python and AI for Data Science By the end of this module, the learner should be able to gain the following knowledge: - Machine Learning Concepts - Various concepts used in Artificial Intelligence

- Statistical Methods in Machine Learning
- Tools and Methodologies used in Python Programming Language
- Python Language Fundamentals: basic syntax, variables and types
- Functions, Packages and Methods used in Python
- Create and manipulate regular Python Lists
- Various statistical algorithms that can be applied in Python
- Basic Plot with Matplotlib
- Control flow and Pandas data frame

By the end of this module, the Learner should be able to apply the following skills:

- Identify Statistical Methods
- Extract, Clean and Transform Data
- Create Data Models using the transformed data
- Develop Simple Python application
- Use functions in Python
- Import packages in Python
- Debug Code to resolve errors in application developed using Python Programming Language
- Utilise and apply statistical algorithm
- Create and customise plots on real data

Module 2: Applied Machine Learning

By the end of this module, the Learner should be able to gain the following knowledge:

- Machine Learning and computational modelling techniques used within it
- Usage of Azure Machine Learning Studio
- Improvement methods of machine learning models
- Evaluate Machine Learning Models
- Planning for Analysis, Power and Simple size planning
- Learn Research practices
- Various research claims
- Survey design and measurement, Reliability and Validity
- Correlation and Experimental design

By the end of this module, the Learner should be able to apply the following skills:

- Develop regression model and classification model
- Improve Machine Learning models
- Clean and Validate date using Azure Machine Learning
- Use optimization-based models
- Apply process in Research and methods of Providing data
- Perform planning for regression model and classification model
- Apply Research claims

Module 3: Advanced techniques in Data Analytics

By the end of this module, the Learner should be able to gain the following knowledge:

- Derivatives and optimisation
- Planning for Analysis, Power and Simple size planning
- Statistics and Probability
- Research practices
- Legal and ethical foundations in Data practice
- Bias in Data processing and Data privacy

By the end of this module, the Learner should be able to apply the following skills:

- Apply System equations and Quadratic equations
- Perform sampling distribution
- Apply Hypothesis testing
- Apply Probability
- Implement IRAC method to identify legal issue
- Apply Classification algorithm to predict recidivism

Module 4: Deep Learning Foundations

By the end of this module, the Learner should be able to gain the following knowledge:

- Machine Learning and computational modelling techniques used in Deep Learning
- Various features within Machine learning and Deep Learning
- Mathematical models and theory applied in Deep Learning
- Evaluate Machine Learning Models
- Multi-Layer perception
- Convolution Neural Network

By the end of this module, the Learner should be able to apply the following skills:

- Apply Deep Learning Concepts
- Develop Multi class classification model using Logistic Regression
- Improve Machine Learning models
- Use Convolution Neural Network
- Apply Recurrent Neural Network (RNN) and Long Short-Term Memory (LSTM)
- Perform Text Classification with RNN and LSTM

Module 5: Reinforcement Learning Foundations

By the end of this module, the Learner should be able to gain the following knowledge:

- Types of information display using Reinforcement Learning
- Techniques used in Data visualization with Reinforcement Learning
- specification and requirements of RL
- Gathering, Processing and optimizing accuracy and functionality in Temporal difference Learning

- Processing multiple streams of data using Deep neural networks
- Understand techniques for Policy gradient

By the end of this module, the Learner should be able to apply the following skills:

- Reflect trends and correlations of data using RL concepts
- Develop news recommendations using RL concepts
- Identify data sources to apply RL concepts in Minecraft game
- Perform data exploration in optimal way
- Apply and implement project Malmo a platform for AI experimentation

Module 6: Develop Applied AI Solutions

By the end of this module, the Learner should be able to gain the following knowledge:

- Understanding on various industry developments and trends in Artificial Intelligence
- Modelling tools used in Natural Language Processing (NLP)
- Functions and Methods applied in NLP
- Various algorithms and its use in Artificial Intelligence
- Deep Reinforcement Learning
- Models used for Machine Learning and Conversation generation
- Documentation requirements and protocols in problem management
- Usage of documentation tools, systems and records to log relevant information throughout the problem's lifecycle
- Best practices in application support
- New and emerging techniques for effective troubleshooting
- Technical and practical constraints of NLP

By the end of this module, the Learner should be able to apply the following skills:

- Apply Functions and Methods in NLP
- Evaluate algorithms to apply in NLP
- Evaluate computational methods to apply in NLP
- Implement Models for NLP
- Implement Capstone Project
- Implement solutions to address the problem through appropriate control procedures
- Develop practices and protocols for NLP application maintenance
- Implement Capstone Project
- Implement solutions to address the problem through appropriate control procedures
- Propose solutions to prevent future occurrences of similar problems
- Document information about problems and the appropriate workarounds and resolutions

Qualification / Certificate Name	Professional Diploma in Artificial Intelligence

Course Pre-Requisites
 	
(e.g.: Academic qualifications, prior experience, etc.)
	Interested individuals and employers need to meet the following criteria:
	
	<u>Individuals</u>
	
	The Programme is open to all company-sponsored applicants who meet the following General Eligibility Criteria:
	
	• Singapore Citizen (SC) or Permanent Resident (PR);
	• Minimum 21 years old;
	• Graduated or completed National Service, whichever is later, at least two years prior at the point of application
	• Not in a same job role prior to joining the PCP;
	• New hires should be hired for not more than three months;
	• New hires must not be in the same job role prior to joining the PCP;
	• New hires must not be a shareholder of the PCP company, or its related companies;
	• New hires must not be related to the owner(s) of the PCP company; and
	• New hires must not be immediate ex-staff of PCP company or its related companies.
	
	Course-Specific Entry Criteria:
	
	• Enrolment for the PCP is subject to employer's selection based on job requirements, and hiring process that may include screening tests and interviews.
	• Enrolment for the PCP is subject to course pre-requisites.
	
	<u>Employers</u>
	
	• Be registered or incorporated in Singapore;
	• Ensure that new hires cannot be:
	    o A shareholder of the PCP company, or its related companies;
	    o Related to the owner(s) of the PCP company; and
	    o Immediate ex-staff of PCP company or its related companies;
	• Offer a full-time PMET position employment contract on permanent terms or on contract terms that are no less than one (1) year;
	• Be committed to work with WSG and its appointed Programme Manager on the necessary administrative matters related to the PCP;
	• Offer employment directly related to the job which the PCP is for, with remuneration that is aligned with the market rate; and
	• Commit to the PCP training arrangements for the trainees.

APPLICATION DETAILS

How To Apply For The Programme	**Applicants**
	Interested applicants can visit www.wsg.gov.sg/pcp to apply. Suitable applicants will be shortlisted by participating employers for interview before embarking on the programme.
	Employers
	Interested employers can contact Lithan Academy (Programme Manager) to register as participating companies.
	Email: **info@lithan.com**