UKaid Skills for Employment Programme

Peer-to-Peer Learning Series:

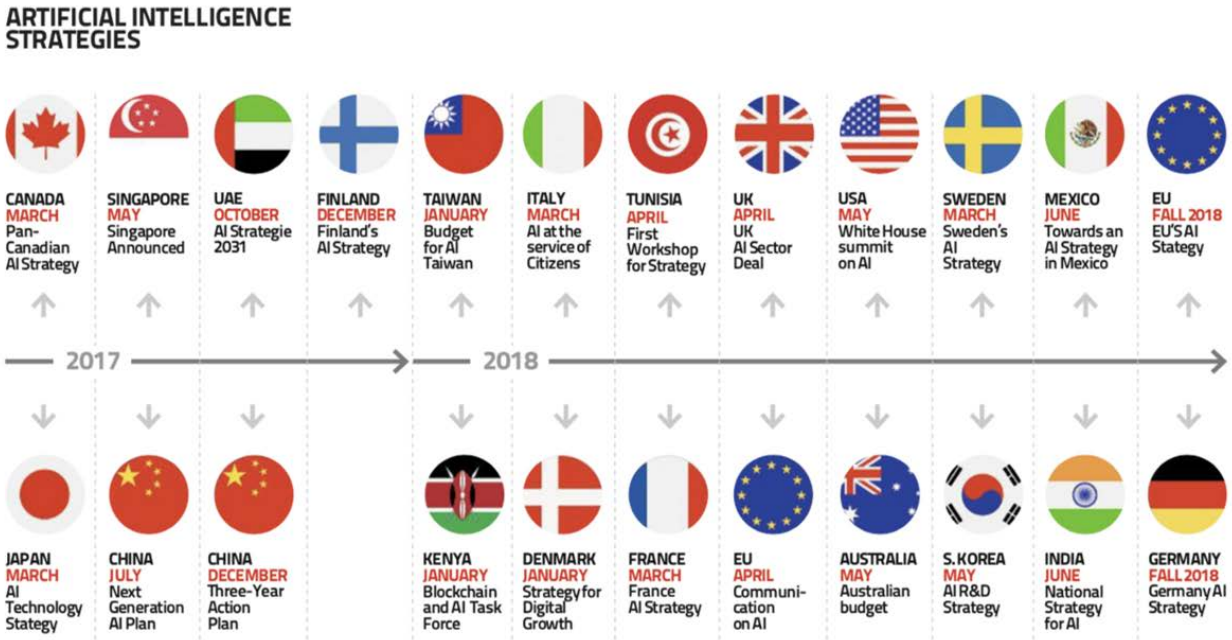
Market-Driven Skilling Initiatives for Employment and Linkage with National Vocational Qualification Framework

Fusemachines AI Shikshya Skilling / Curriculum Approach

Date: Dec 10,2020

Rojesh M. Shikhrakar
Content & Curriculum Lead

In Collaboration with



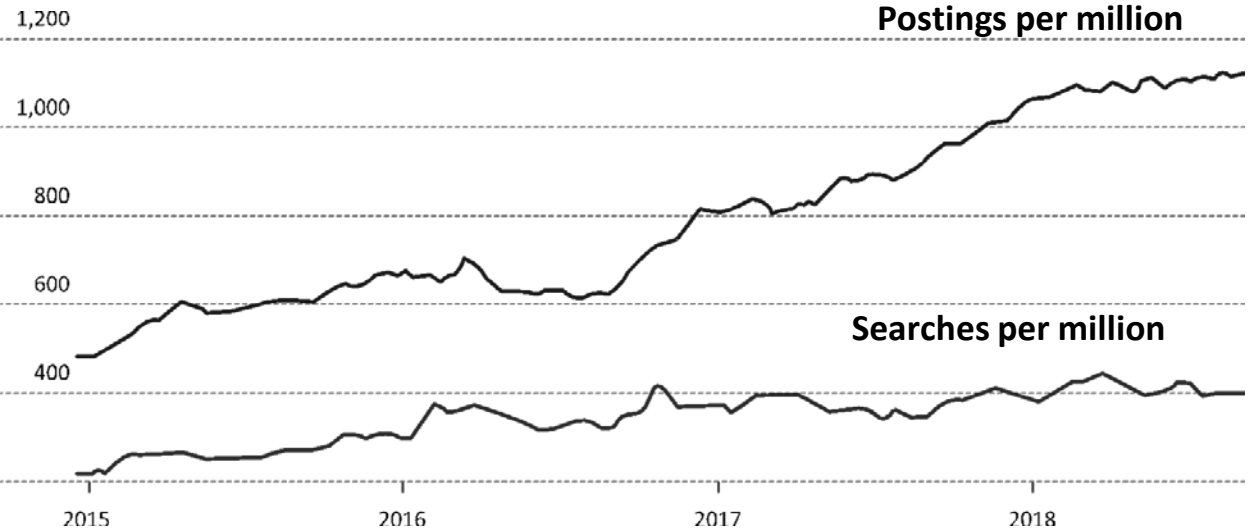
"Artificial intelligence (AI) is the new electricity"

- Andrew Ng

270% Growth in AI adoption in last four years

- **Mckinsey Global Institute**

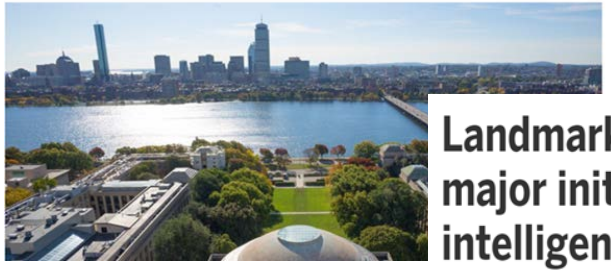
AI job openings are rising faster than job seekers



“58 Million” AI Jobs by 2022

- World Economic Forum

MIT has just announced a $1 billion plan to create a new college for AI



Landmark $60M gift to establish major initiative in artificial intelligence at Indiana University

IU School of Informatics, Computing and Engineering to be named for alumnus and technology pioneer Fred Luddy

Stephen Schwarzman gives $188 million to Oxford to research AI ethics

University of Toronto to build new AI innovation centre with $100 million 'largest donation ever'

UK government backs Microsoft and University of Cambridge mission to build better AI

Talent is everywhere, but opportunity is not.

fuse|machines AI Shikshya for Nepal


fuse | machines
“DEMOCRATIZE AI”
AI Fellowship
25 students in 2017 to 250+ 2019

Fuse.ai Scholarships (Online + OpenSession)

250 Scholarships in Jan 2019

Fuse.ai MicroDegree™ Program (Online + Onsite)

Second Batch Starting in Jan

Fusemachines Launches 'AI Shikshya for Nepal' in Partnership With Colleges

Posted: Nov 27, 2019 6:46 PM

Program Design

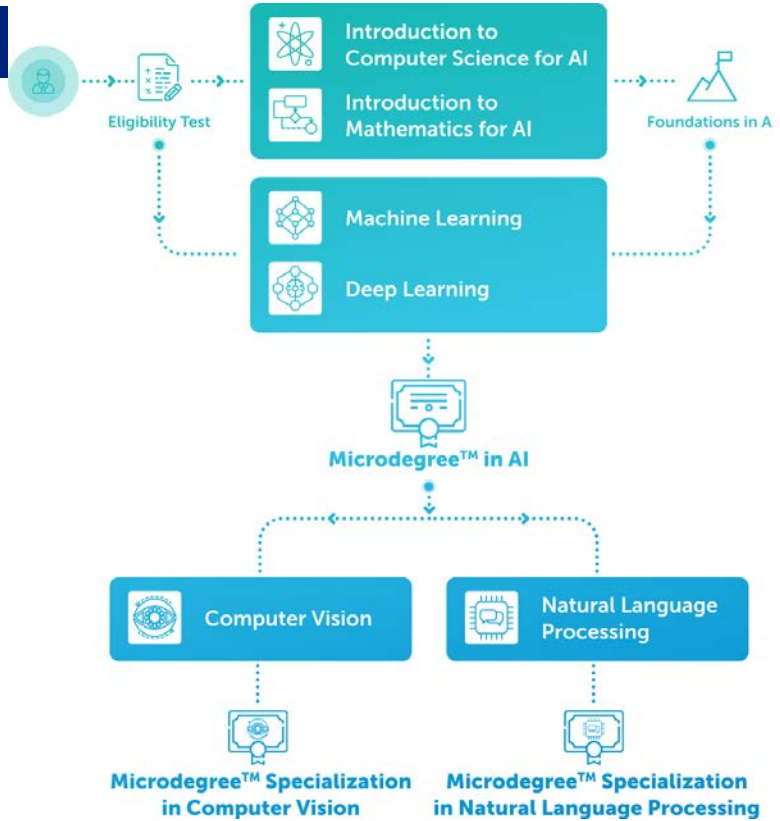
Target Group (Eligibility):

- Students in BSc and BIT level
- New course for entrepreneurs, business owners
- Course for professionals from different background

Common Objective of different programs:

- Gain both theoretical and hands-on knowledge on specific topics
- Prepare students for Job is AI Sector:
  - Data Analyst
  - ML Engineer, Data Engineer
  - Computer Vision Engineer …

Tentative Timeline: 10-12 weeks course ~48-72 hrs



Courses Offered

Program	Courses	Levels
Foundation for AI	CS for AI	
	Maths for AI	
Microdegree	Machine Learning	Level 1and 2
	Deep Learning	Level 1and 2
Specialization	Computer Vision	Level 1and 2
Specialization	Natural Language Processing	Level 1and 2
	AI for Business	
Specialization	AI for Health Care	
Specialization	Data Engineering	

Market Driven Approach to Education

Level 1 : No/Less maths more coding

Level 2 : Maths foundation + advanced coding

python Programming

Tensorflow vs. Pytorch

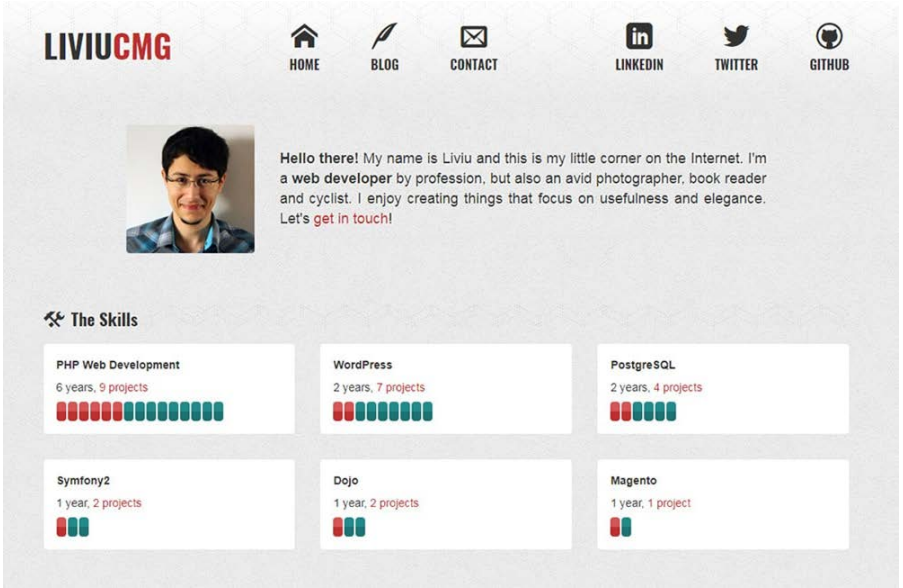
NumPy SciPy

pandas matplotlib

Course Design focused on common Skill required in IT jobs

Introduction to CS for AI

1. Introduction to the CS for AI
2. Basics of Computer Systems: Digital Logic, Computer Architecture, Linux OS, Computer Networks
3. Python Programming: Core and Frameworks
4. Data Structures and Algorithms
5. Database: SQL and NoSQL
6. Application Development: Software development life cycle, web frameworks, deployment



Project: Designing Personal Portfolio website

Blended Learning Approach

Online

Web | Mobile | CodeHub

Self-paced learning

Forum for connectivism

Videos + Subtitles
Reading Materials
Quizzes with Feedbacks
External Reading
Programming Assignment
Forum Discussions

Seminars with famous AI Speakers
Webinars by PhD Experts

+

Onsite

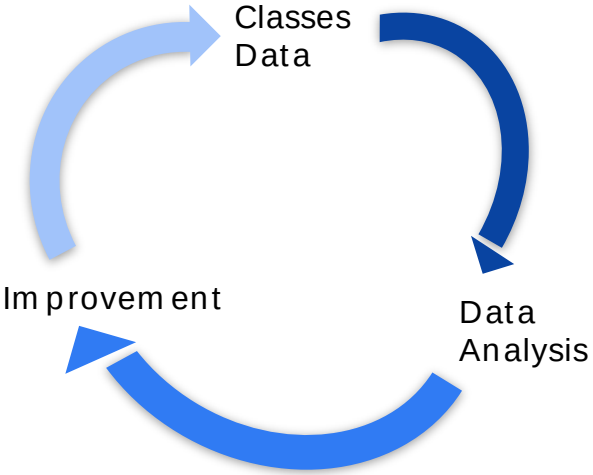
Classroom Discussions

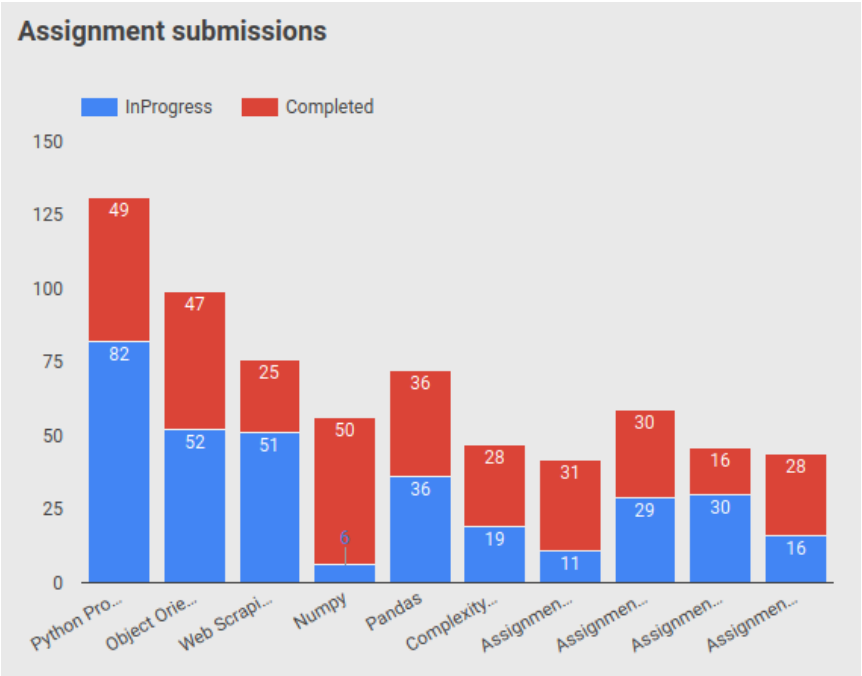
Industry Experts Led Class

Hands-on approach

Lecture / Discussions
Problem-based Learning (PBL)
Individual Feedback
Peer Programming
Class Projects

Data-Driven Education Approach

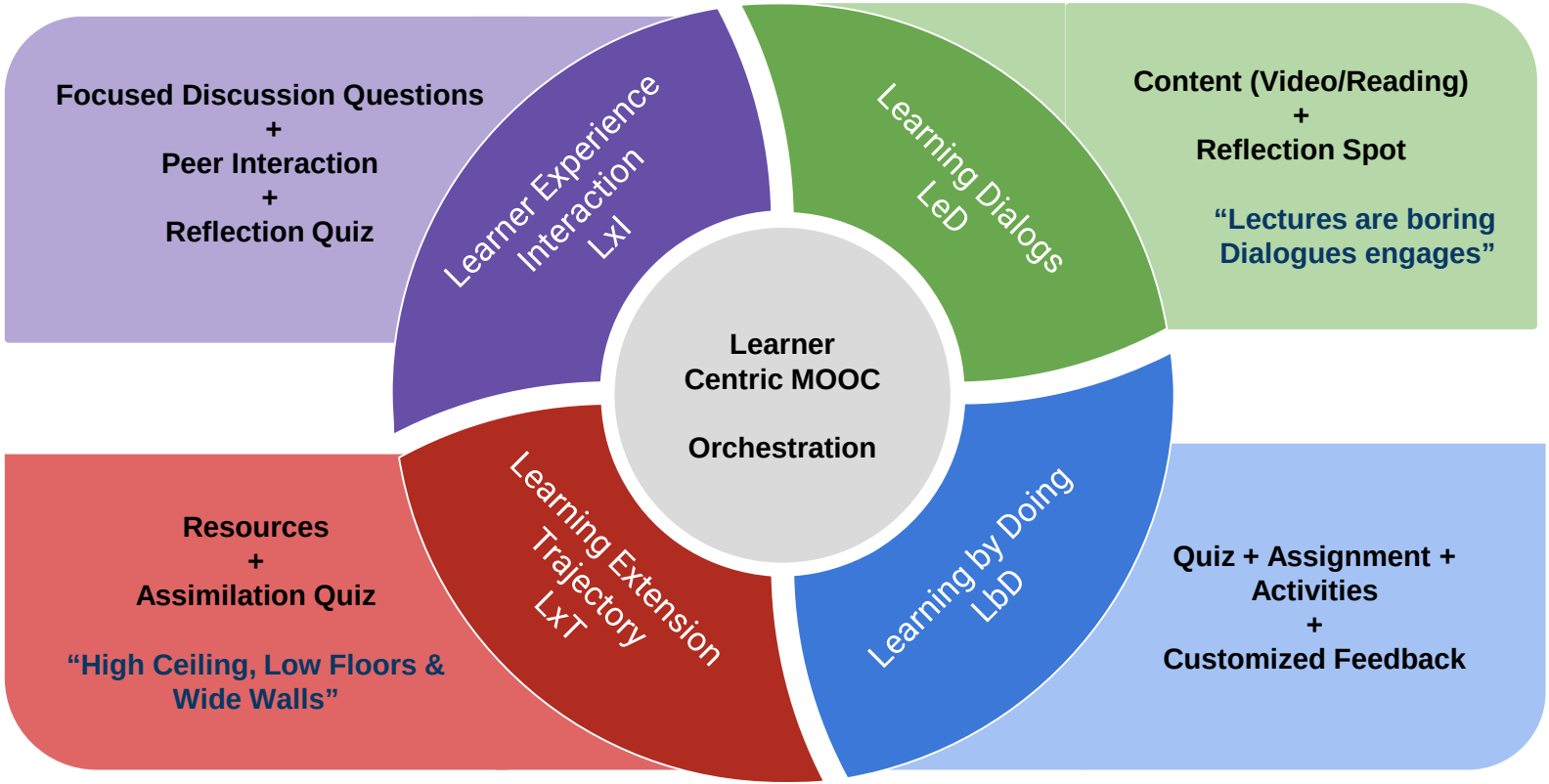




Incorporating Education Researches

- Incorporating different Educational Research and Teaching Pedagogies
  - Flipped Classroom
  - Inquiry based Learning
  - Problem Based Learning (PBL)
  - Pedagogy and Andragogy
  - Learner Centric MOOC Structure and Learning Experience Design

- Training of Trainers (ToT) Sessions
  - Classroom Management
  - Lesson Planning
  - Micro-teaching Sessions


Focused Discussion Questions
+
Peer Interaction
+
Reflection Quiz
Learner Experience Interaction
LxI
Learning Dialogs
LeD
Content (Video/Reading)
+
Reflection Spot
"Lectures are boring
Dialogues engages"
Learner
Centric MOOC
Orchestration
Resources
+
Assimilation Quiz
"High Ceiling, Low Floors &
Wide Walls"
Learning Extension
Trajectory
LxT
Learning by Doing
LbD
Quiz + Assignment +
Activities
+
Customized Feedback

Curriculum Design

Lesson Plan for M7: **Probabilistic Models**

Learning Objectives:

By the end of the lesson, **all learners** will be able to (minimum expected from everyone) :

1. explain basics of probability distribution as applied to generative models
2. Implement a generative model for classification
3. Explain the parameter estimation using MLE and MAP
4. Explain how MLE is applied in case of linear and Logistic Regression

By the end of the lesson, **some students will be able to (those wishing to push themselves)**

1.

Detail Outline:

Unit 1. Introduction to Probabilistic Models

Chapter 1.1. Generative Approach to Classification:

1.1.1. Discuss the difference between Discriminative vs Generative Approach (pros and cons)

1.1.2. Fit probability distribution to each class separately, for inference to predict the probability of belonging to a class.

Chapter 1.2. Frequentist vs Bayesian Approach to Probabilistic Models

1.2.1. Compare and Contrast Frequentist vs Bayesian Approaches to probability and Statistics

1.2.2. Different estimation example in both views

Unit 2. Probability Distributions

Assumed prior knowledge of Students:

- Students should complete
  - ML L1 Course
  - Linear Regression of L2
- Basics of Probability: Joint/Conditional Probability, Random Variables, Expectation and Variance
- Multivariate Calculus: Perform partial Differentiation and Integration

Resources:

- [1411.5018] Frequentism and Bayesianism: A Python-driven Primer
- Frequentism and Bayesianism: A Practical Introduction
- CS109: Probability for Computer Scientists
- CS109 with videos
- PRML by Bishop

For every Course

- ❖ Modules
  - ➢ Units
    - ■ Chapters
      - Video + Subtitles
      - Reading Materials
      - Quizzes
      - Programming Material
    - ■ Assignments
  - ➢ Projects

Examinations

Exploring Alignment with National & International System

Courses offered as Elective Subjects in University Affiliated Colleges

HERALD COLLEGE KATHMANDU

ing GROUP

Samriddhi

Samriddhi College (T.U. Affiliated)
Lokanthali-16, Bhaktapur

THAMES INTERNATIONAL COLLEGE

sagarmatha ENGINEERING COLLEGE
TRIBHUVAN UNIVERSITY AFFILIATE

Fusemachines
AI School

Kathmandu, Nepal

Santa Domingo,
Dominican Republic

Courses Integrated as credit courses

NCC
Norwalk Community College

pcps COLLEGE

Summary

1. Market-Driven Approach : Focus on Work Skills than Academics
2. Blended Learning with Online and Onsite component with Industry exposure
3. Data-Driven Education Approach: Data Analysis to support students and improve course works
4. Incorporation of Educational Research into Content and Curriculum Design: eg: Learner Centric MOOC
5. Exploring Alignment with National and International Education Systems: Offering elective and for credit courses in different university affiliated colleges

Thank you

FOR ADDITIONAL INFORMATION

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