



**INTERNATIONAL AI STARTUP PROGRAM (Online Program for 2021)**

**Who is this program for:**

**Summer 2021 is designed specifically for Korean University Students**

**Cost: \$1500/student**

**Duration: 8 Weeks**

**Location: Virtual**

We design and run our short-term programs to help students gain applied AI projects with a startup accelerator experience. This program is an assimilation of an 8 week startup accelerator for engineers.

**PSAI Summer 2021 (6/29 - 8/24)**

8 Weeks AI Training Program consists of:

1. AI Short Term Training and weekly assignments
2. AI Applied Group Project
3. Weekly startup lessons and assignments
4. Weekly peer review with mentors (Minimum mandatory 5 Hrs per week)

Short-Term Training	Fast AI Study	8 Weeks Daily Study, online discussion with mentor 3 hrs/week			
AI Project	2 Project, 4 Teams (Actual project)	Mentor Hrs. Mandatory 2hrs/week			
		Mon.	Tues.	Wed.	Thurs.
	Discussion 1.5 hrs	Mandatory		Mandatory	
		Project A	Project B	Project A	Project B
	Project Mentor 1 hr per team	Team 1	Team 3	Team 1	Team 3
		Team 2	Team 4	Team 2	Team 4

**Extra Curricular:**

Technical virtual subject meetups; (if time differences are allowed) Evenings List of PS events:  
<https://www.meetup.com/peoplespace/> OCRUG, OCJUG, OWASP, OCANDROID, DEEP LEARNING, AI & ANALYTICS

## PROJECTS:

Projects are tailored and coincides with AI Curriculum with startup components included.

TENTATIVE PROJECTS: (Subject to change depending on size of class and level of competency.)

### Background Removal with AI

<https://docs.google.com/document/d/1uwurnj0Nba3oLHkDmpwBi19KUhAQKM61pvFMeVOiD2Y/edit#heading=h.la3koologj3i>

### Bad Print Detector

[https://docs.google.com/document/d/1G82chlccZxA7LcEICKvZbniPlrzZ8WFzJxYJUzJka\\_/edit?usp=sharing](https://docs.google.com/document/d/1G82chlccZxA7LcEICKvZbniPlrzZ8WFzJxYJUzJka_/edit?usp=sharing)

#### Pre-Req

- Please sign up for free trial at <https://cloud.google.com/> 2 weeks prior to arrival.
- Basic understanding of python
- Basic understanding of Git

Week #	Topic
Week 1	Image Classification
Week 2	Data cleaning and production; SGD from scratch
Week 3	Data blocks; Multi-label classification; Segmentation
Week 4	NLP; Tabular data; Collaborative filtering; Embeddings
Week 5	Back propagation; Accelerated SGD; Neural net from scratch
Week 6	Regularization; Convolutions; Data ethics
Week 7	Resnets from scratch; U-net; Generative (adversarial) networks
Week 8	Final Presentations

**Sample detailed concepts the first two sessions:**

	Hours	Description	Weekly concepts and Activity (FastAI & Project)	Startup Activity
Wk 1	20-25	The key outcome of this lesson is that we'll have trained an image classifier which can recognize pet breeds at state of the art accuracy. The key to this success is the use of transfer learning, which will be a key platform for much of this course. We'll also see how to analyze the model to understand its failure modes. In this case, we'll see that the places where the model is making mistakes is in the same areas that even breeding experts can make mistakes.	Week 1 Concepts Neural Nets: a brief history Stochastic Gradient Descent (SGD) Reading Fast AI Documentation Applications: Image Segmentation Classifying a review's sentiment based on IMDB text reviews Predicting salary based on tabular data from CSV Project Deliverables: * Git Repo	Draw and espression
Wk 2	20-25	<p>Learning how to build your own image classification model using your own data, including topics such as:</p> <ul style="list-style-type: none"> <li>-Image collection</li> <li>-Parallel downloading</li> <li>-Creating a validation set, and</li> <li>-Data cleaning, using the model to help us find data problems.</li> </ul> <p>In the second half of the week we'll train a simple model from scratch, creating our own gradient descent loop.</p>	<p>Week 2 Concepts Classification vs Regression Validation data set Epoch, metrics, error rate and accuracy Overfitting, training, validation and testing data set How to choose your training set Transfer learning, and why it works so well Fine tuning Arthur Samuels approach to neural networks Model Interpretation, P value Null Hypothesis, Significance Testing Recommendation vs Prediction Predictive Modeling Deep Learning in Practice: Using an Image Search API (Bing) Data Block API Applications: * Vision techniques used for sound * Using pictures to create fraud detection at Splunk * Detecting viruses using CNN Project Deliverables: * Mockups / Wireframes Terms * label * architecture * model * parameters * fit * train * pretrained model * fine tune * epoch * loss * metric * validation set * training set * overfitting * CNN</p>	30 Second Pitch

**Final grade and assessment based on:**

1. Midterm assignment
2. Project individual grade
3. Project group grade
4. attendance
5. self and peer review
6. extra credit