Intel® Unnati

Data-Centric Labs in Emerging Technologies

Give Your Students the Intel Edge.

AIIoT

Today, there is a wide, and growing, skill gap between technical graduates and IT industry expectations. To propel India's digital economy transformation, it is imperative that the higher education system in the country bridges this gap by developing new curricula and offering courses in emerging technologies. The National Education Policy 2020[1] recognises this, and stresses the need for greater industry-academic linkages, and for higher education institutions to focus on research and innovation.

With the **Intel® Unnati Program**, you can keep pace with fast changing industry needs and expectations. It will help you:

Equip your students with industry relevant data-centric skills

In this age of data explosion, there is immense opportunity. Give your students the edge by equipping them with data-centric skills that will help them glean better insights and develop high-value solutions.

Unleash your students' creative potential

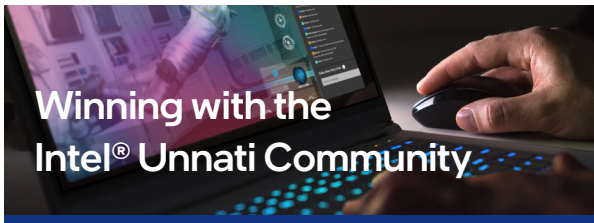
We, in India, have an incredible opportunity to unleash the creative potential of the largest student population in the world by training them in the right skills to drive India's digital transformation.

Build a strong reputation

With an Intel co-branded lab, you can be recognised as an institute that is committed to train your students in the latest technology to prepare them for industry, and focus on faculty development.

Build capability for the long term

Establish and maintain your leadership with the help of our **System Integrator Associates**. From Intel's recommendations* for end-to-end technology labs set up and course content to training, customisations of your lab set up, or your maintenance and support requests, you can rely on them for all your needs.



Winning with the Intel® Unnati Community

With an Intel® Unnati Lab, you—and your faculty and students—become part of the **Intel® Unnati Community**, and get exclusive benefits:

- **Intel® Unnati Grand Challenge**, where students solve industry relevant, high impact problems through technology, with cash awards and the opportunity to be evaluated for internships at Intel
- **Intel® Unnati Ignite** workshops that offer hands-on experience with Intel technologies
- **Intel® Unnati Catalyst** co-sponsorships of events focused on new technologies
- **Intel® Unnati Industrial Training**, where qualifying students work for a month on industry relevant problems under the guidance of industry mentors
- **Intel® Unnati Research Launchpad**, which offers grants to faculty members for original research in new and emerging technologies

[1]Ministry of Human Resource Development, Government of India, National Education Policy 2020, *https://static.pib.gov.in/WriteReadData/userfiles/NEP_Final_English_0.pdf*

*Please work with the System Integrator Associate to understand the compute configuration that suits your requirement. Intel's recommendation is generic in nature and the lab setup is customisable.

Intel® Unnati
AIoT

Harness the power of AI and IoT

As more devices get smart and connected, several usages are emerging where IoT and AI are being combined to make intelligent decisions. Per a Global Market Insights report[1], the Artificial Intelligence of Things market size is expected to grow at a CAGR of 20% between 2023 and 2032, to be $25 billion by that time. With demand in Edge Computing and AI with Computer Vision use cases only expected to increase, you can help your students stay ahead of the curve with labs that show them how to harness the power of these technologies.

Over 100 hours of courses

The lab features a course in IoT fundamentals by professors from Indian Institute of Science, Bengaluru, along with courses from Intel that span Machine Learning, Deep Learning, and Intel® Distribution of OpenVINO™ Toolkit.

Accelerate your students' learning

From the OpenVINO™ Model Zoo, students can download free pre-trained models to begin their development process. With OpenVINO™ Training Extensions, a low-code transfer learning framework for Computer Vision, students can train, infer, optimise and deploy models easily and quickly even with low expertise in the deep learning field. Further, with Edge Insights for Vision SW and Intel® Edge Software Hub reference implementations, students would gain hands-on experience in building Edge/AIoT applications.

The following are recommended reference implementations:

- Automated Number Plate Recognition
- Road Sign Detection and Classification
- Work Zone Analytics
- Vehicle Event Recording

Ref: *https://www.intel.com/content/www/us/en/developer/topic-technology/edge-5g/edge-solutions/overview.html*

[1] *https://www.gminsights.com/industry-analysis/aiot-market*




AI and IoT are improving efficiency and access in *(clockwise from top left)* agriculture, manufacturing, healthcare, retail and all other sectors of the economy, thereby impacting every aspect of our lives.

Intel® Unnati AIoT Lab

Suggested lab configuration for a batch size of 30 students

For institutions that are considering an affordable, yet capable, solution to kickstart their journey into AI and IoT

Minimum Suggested Specifications

Hardware				Software
Server/Workstation	**Component**	**Product Description**	**Quantity per System**	
▪ 1 x Master Node	Memory	32GB RDIMM, 1 Rank, 4800MHz	8	▪ Ubuntu* 22.04 LTS ▪ Intel® oneAPI Base Toolkit ▪ Intel® AI Analytics Toolkit ▪ Horovod* + Intel® MPI (for distributed DLtraining with TensorFlow*) ▪ Intel® Extension for PyTorch* (IPEX) ▪ Intel® Distribution of OpenVINO™ Toolkit ▪ JupyterHub* and JupyterLab* ▪ Keras*, ipykernel*, Seaborn* + other libs as required by exercises **Note:** Check *https://software.intel.com/* containers for available AI containers
	Processor	Intel® Xeon® Silver 4410, 12 Core, 2 GHz, 150W	2	
	Management Key Options	Advanced System Management Key	1	
	Power Supply	1300W Power Supply	2	
	Dual Hyper Hybrid Controller	M.2 Card RT3EX020E with HW RAID	1	
	TPM	Version 2.0	1	
	M.2 Drive	480GB SATA	2	
	Front Bay 1, Drive 01	1.92T 2.5 NVME4	1	
	Onboard NVME Cable 1	Cable Kit CBLMCSL1204KIT	1	
	Networking IO Modules	X710-T2L for OCP 3.0	1	
	+ Heat sink, Riser Card, Rail Option (Please discuss with System Integrator for options)			
▪ Minimum 2 x Compute Nodes	Memory	32GB RDIMM, 1 Rank, 4800MHz	8	
	Processor	Intel® Xeon® Gold 6430, 32 Core, 2.1 GHz, 270W	2	
	Management Key Options	Advanced System Management Key	1	
	Power Supply	1300W Power Supply	2	
	Dual Hyper Hybrid Controller	M.2 Card RT3EX020E with HW RAID	1	
	TPM	Version 2.0	1	
	M.2 Drive	480GB SATA	2	
	Front Bay 1, Drive	Front Bay 1, Drive	1	
	SATA Cable	1.92T 2.5 NVME4	1	
	Networking IO Modules	X710-T2L for OCP 3.0	1	
	+ Heat sink, Riser Card, Rail Option (Please discuss with System Integrator for options)			
▪ 1 x Storage Server	2 TB space (or as per requirements)		1	
▪ Network Router with 10Gbps Ports, Network Switch, Rack Cabinet, Power Delivery Unit (PDU), Patch Cables and Power Cable ▪ Intel® OpenVino™ labs will be run on Intel® DevCloud for the Edge				Software for job scheduling and queueing
▪ Minimum 15 x Development Kits	AAEON UP Squared i12 Edge Series with 12th Generation Intel® Core™ i5 processor, 16 GB Memory and 128 GB SSD, with WiFi module and Power Supply. Refer below datasheet for full specification: *https://downloads.up-community.org/download/up-squared-i12-edge-datasheet/*			▪ Ubuntu* 22.04 LTS ▪ Latest Edge Insights for Vision from: *https://edgesoftware.intel.com/visioninsights* This includes Intel® Distribution of OpenVINO™ Toolkit
▪ 15 x Monitors (1 per Development Kit)	Both HDMI and DisplayPort interface available in above kit.			

Important notes relating to all AI Lab Configurations

1. If Network File System (NFS) is installed, then all Intel software tools need to be installed only once through any of the compute nodes on to a network location visible to all nodes. If you don't have NFS, then only the runtime components of Intel tools need to be installed on the hard drive of every node.
2. Initialise MPI environment first before installing Horovod*. (source setvars.sh)

To know more about how your institution can benefit from the Intel® Unnati Program, please contact:

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