MPRSS 2020

6th IAPR Workshop on Multimodal pattern recognition for social signal processing in human computer interaction

ulm university universität ulm

DEEP LEARNING INSTITUTE

BRINGING GPU ACCELERATED COMPUTING AND DEEP LEARNING TO THE CLASSROOM

Mariofanna Milanova , Friedhelm Schwenker

IAPR TC 9: Pattern Recognition in Human-Machine Interaction

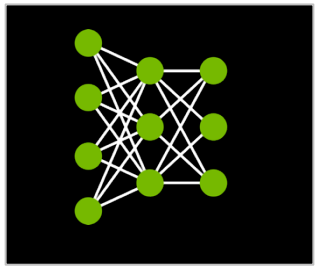
Training developers, data scientists, researchers and IT professionals how to solve their most challenging problems

RICH CONTENT PORTFOLIO

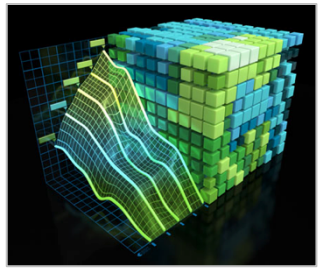
Fundamentals and advanced hands-on training in key technologies and application domains

www.nvidia.com/dli

Caffe2 · Microsoft Cognitive Toolkit · mxnet · TensorFlow · PYTORCH · Keras · theano



Deep Learning Fundamentals

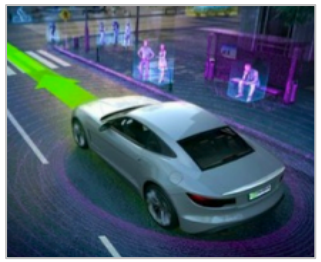


Accelerated Computing Fundamentals

Accelerated Data Science Fundamentals

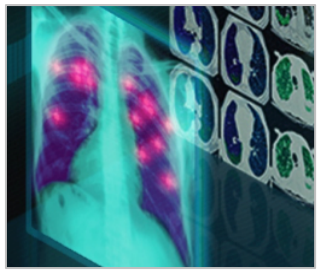
Intro to AI in the Data Center

AI for Anomaly Detection



AI for Autonomous Vehicles

AI for Digital Content Creation



AI for Healthcare

AI for Industrial Inspection

AI for Intelligent Video Analytics

AI for Predictive Maintenance

AI for Robotics

DLI ECOSYSTEM

Large and Growing Worldwide

- Over 200,000 developers trained
- 33 SDP-ES delivery partners
- Global distributors and resellers selling DLI
- 550+ certified instructors (incl; NV, SDP-ES and Ambassadors)
- 330+ Ambassadors across 270 institutions (including computing centers)

INSTRUCTOR-LED WORKSHOPS

In-person or Remote

AGENDA

Introduction (45 mins)

Break (15 mins)

Training task #1 (1:20 mins)

Lunch (60 mins)

Training task #2 (1:20 mins)

Break (15 mins)

Training task #3 (1:20 mins)

Summary/Q&A (15 mins)

BENEFITS OF WORKSHOP

Get guidance from DLI Certified Instructors while working through material

Hear from experts during the introductory lecture

Collaborate with and learn from peers

Access fully-configured, GPU-accelerated workstations in the cloud

Earn a certificate of competency in course subject matter

FUNDAMENTALS WORKSHOPS (January 2021)

All Instructor-led Workshops Offer a Certificate of Competency

AREA	TOPIC
Fundamentals of Deep Learning	Fundamentals of Deep Learning (New)
	Building Intelligent Recommender Systems (New!)
	Deep Learning for Industrial Inspection
	Applications of AI for Predictive Maintenance
Fundamentals of Accelerated Computing	Fundamentals of Accelerated Computing with CUDA C/C++
	Fundamentals of Accelerated Computing with CUDA Python
	Fundamentals of Accelerated Computing with OpenACC
Fundamentals of Accelerated Data Science	Fundamentals of Accelerated Data Science with RAPIDS

INDUSTRY WORKSHOPS (January 2021)

All Instructor-led Workshops Offer Certificate of Competency

INDUSTRY	TOPIC
Autonomous Vehicles	Deep Learning for Autonomous Vehicles – Perception
Anomaly Detection	Applications of AI for Anomaly Detection
Digital Content & Game Development	Deep Learning for Digital Content Creation Using Autoencoders
Healthcare	Deep Learning for Healthcare Image Analysis
Industrial Inspection	Deep Learning for Industrial Inspection
Intelligent Video Analytics	Deep Learning for Intelligent Video Analytics
Predictive Maintenance	Applications of AI for Predictive Maintenance
Robotics	Deep Learning for Robotics

ONLINE TRAINING

BENEFITS OF SELF-PACED TRAINING

Take training any time, anywhere. All you need is a laptop and Internet connection.

Access fully configured, GPU-accelerated workstations in the cloud for hands-on training.

Learn at your own pace with hands-on exercises and videos.

Earn a certificate of competency in 8-hr course subject matter (digital badge of completion for IT training.)

Customers can purchase bulk codes for online courses

ONLINE, SELF-PACED COURSES(January 2021)

DLI Course Catalog

DLI offers courses in the following areas:
Deep Learning Fundamentals
Deep Learning for Digital Content Creation
Deep Learning for Healthcare
Deep Learning for IVA
Accelerated Computing
Accelerated Data Science
AI Course for IT

WHAT DOES DLI OFFER?

SELF-PACED ONLINE

- Get started anywhere, any time with access to a GPU-accelerated workstation in the cloud
- Full-day courses (8 hrs) are $90
- 2-4 hour courses are $30

Bulk pricing is also available

Get started www.nvidia,com/dli

INSTRUCTOR-LED WORKSHOP

- Full-day workshops onsite at your location or remote, delivered by DLI certified instructors
- MSRP: $10K/day for up to 20 attendees (EDU pricing available)
- Request through your account manager

Public workshop schedule here.

ENTERPRISE SOLUTIONS

- End-to-end training solution with executive briefings, enterprise-level reporting, and a mix of onsite and online training
- Pricing varies
- Request through your account manager

DLI UNIVERSITY TRAINING

Learn more at
www.nvidia.com/dli

UNIVERSITY AMBASSADOR PROGRAM

- Qualified faculty and researchers can get certified to teach DLI workshops to their students at no cost.
- Hundreds of universities certified around the world, including:

Arizona State University
Columbia University in the City of New York
香港科技大學 The Hong Kong University of Science and Technology
Massachusetts Institute of Technology
NUS National University of Singapore
University of Oxford

TEACHING KITS

- Qualified university educators can download courseware across deep learning, accelerated computing, and robotics.
- Kits include lecture materials, GPU cloud resources, access to self-paced DLI courses, and more.

BARRIERS TO TEACHING NEW TECHNOLOGIES

TIME

Solution: Ready-made teaching material in a variety of content types

FUNDING

Solution: Free software tools, computing resources, hardware discounts

THEORY VS APPLIED

Solution: Content co-developed by NVIDIA and leading academic educators

CONTENT FAMILIARITY

Solution: Support from NVIDIA and educator community

NVIDIA.

BREAKING THE TIME BARRIER

Ready-made Teaching Content

Comprehensive source-level materials:

- Lecture slides
- Lecture videos
- Hands-on coding labs/solutions
- Larger coding projects/solutions
- Quiz/exam questions/solutions

BREAKING COST BARRIERS

Free/Low-cost Computing Tools and Resources

Free AWS Educate cloud credits

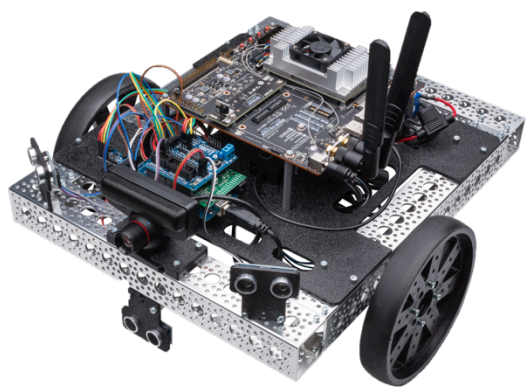
Free online, self-paced Deep Learning Institute (DLI) courses and student certification

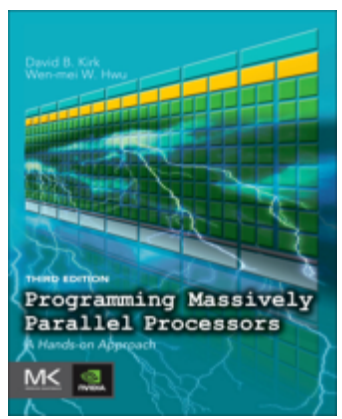
GPU hardware discounts

Textbooks/eBooks

NVIDIA DEEP LEARNING INSTITUTE

aws educate





DLI TEACHING KITS

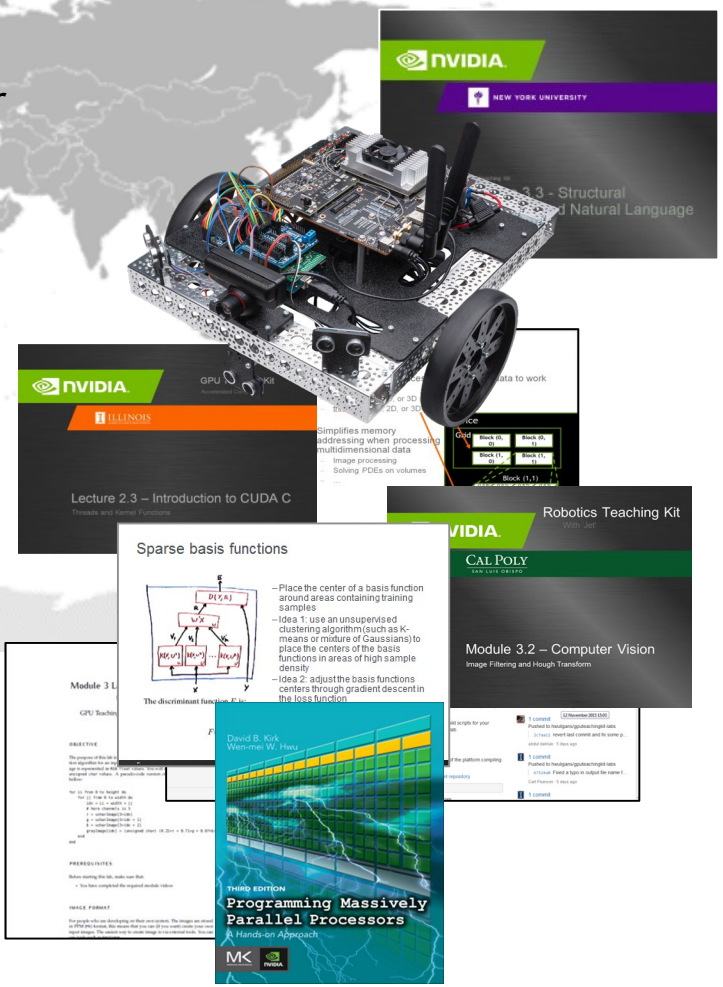
Advancing Education with GPU Acceleration

Downloadable, semester-long university curriculum course material for verified university faculty and TAs:

- Lecture slides
- Lecture videos
- Hands-on labs/solutions
- Larger coding projects/solutions
- Quiz/exam questions/solutions
- Text and e-books
- **Free DLI online courses/certifications**
- Syllabus **(with suggested DLI online courses)**

Different kits for different courses

Machine/Deep Learning (NYU/Yann LeCun) **Accelerated/ Parallel Computing (CUDA)** (UIUC/Wen-Mei Hwu) **Robotics** (CalPoly/John Seng)
Future *(Data Science/RAPIDS, OpenACC, Domain Sciences, etc.)*



developer.nvidia.com/teaching-kits

NVIDIA DEEP LEARNING INSTITUTE

DL TEACHING KIT

Available Free Now for Qualified Educators!

Co-developed with Prof. Yann LeCun (NYU)

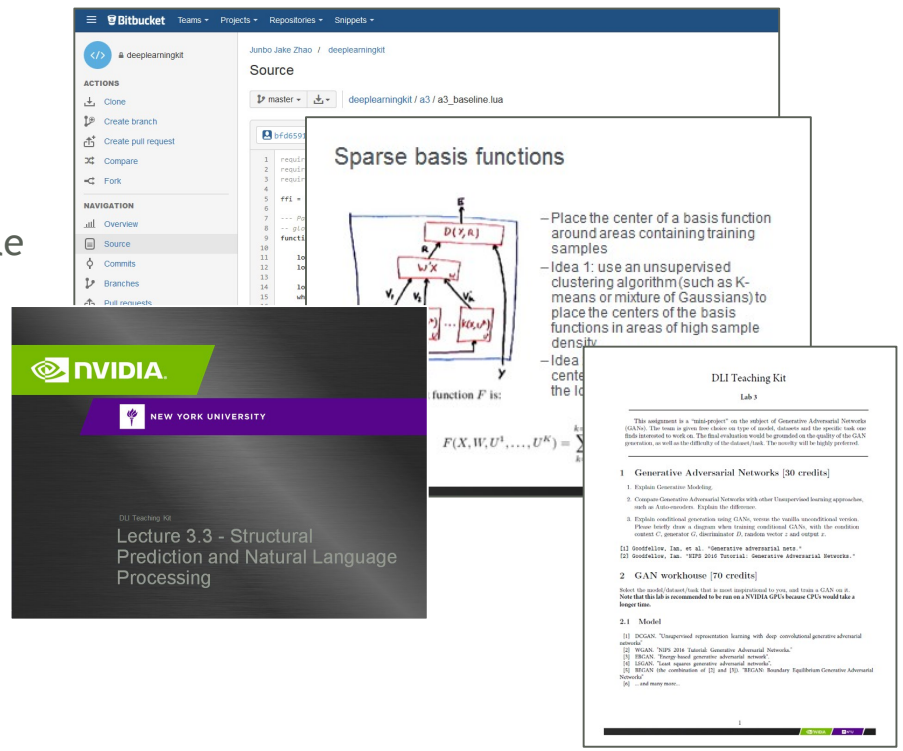
Comprehensive teaching materials:

- Lecture slides
- Hands-on labs/solutions with optional assessment rubric using Kaggle
- Quiz/exam problem sets/solutions

GPU compute resources:

- Free DLI online courses/certifications Free AWS cloud credits

developer.nvidia.com/teaching-kits



DL TEACHING KIT

Module Goals

Teach academic theory and application of DL harnessing the PyTorch and Torch frameworks

Technical subjects:

Intro to ML/DL Applied Image Classification Applied Object Detection Convolutional NNs Applied Image Segmentation Energy-based Learning	Unsupervised Learning Generative Adversarial Networks Optimization Techniques Recurrent NNs Natural Language Processing And more!

GPU TEACHING KIT FOR ACCELERATED COMPUTING

Available Now Free for Qualified Educators!

Co-developed with Prof. Wen-Mei Hwu (UIUC)

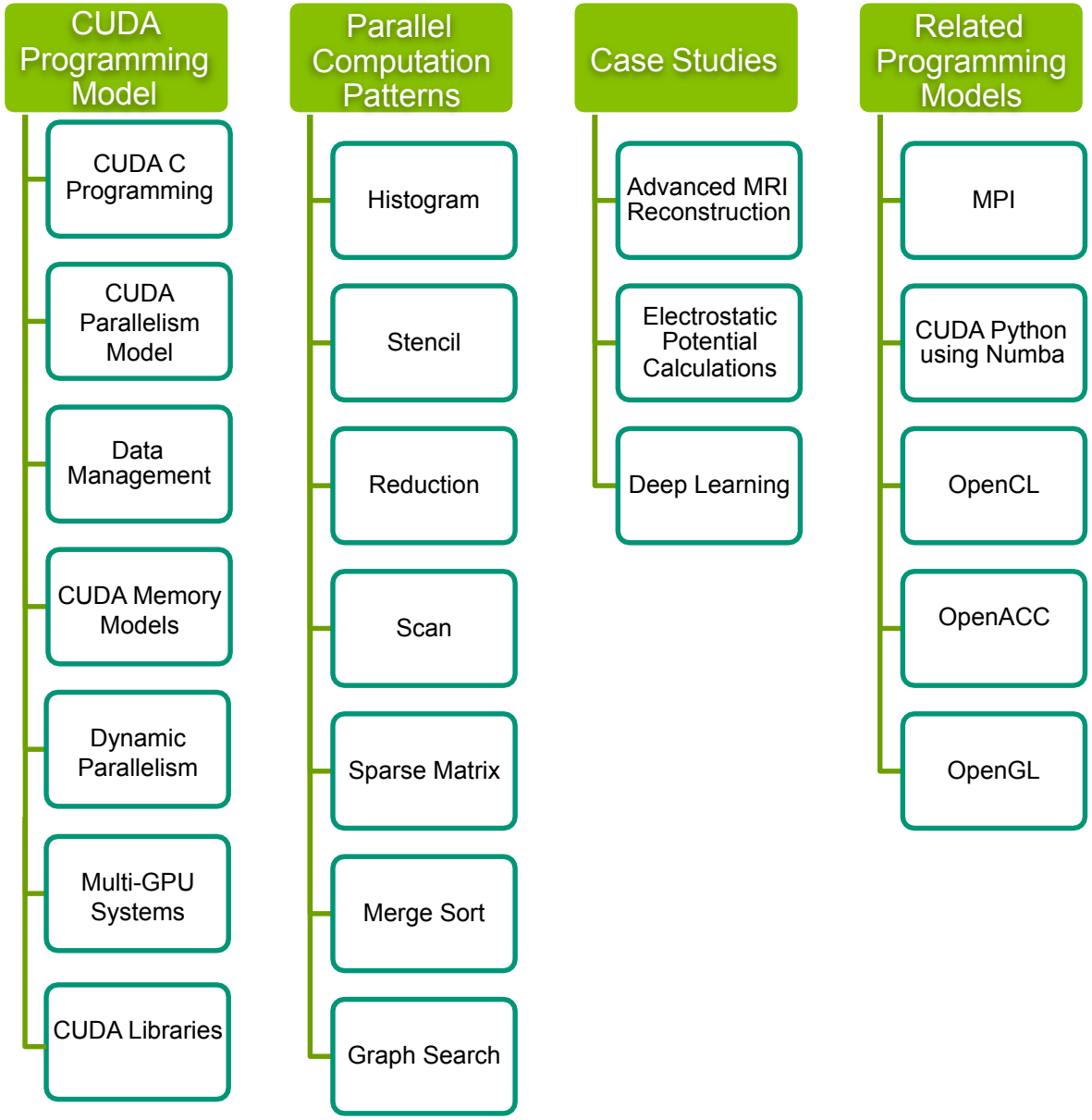
Comprehensive teaching materials:

- 3rd Ed. PMPP E-book by Hwu/Kirk
- Lecture slides and notes
- Lecture videos
- Hands-on labs/solutions
- Larger coding projects/solutions
- Quiz/exam questions/solutions

GPU compute resources:

- Free DLI online courses/certifications
- Free AWS cloud credits

developer.nvidia.com/teaching-kits



NVIDIA DEEP LEARNING INSTITUTE

ROBOTICS TEACHING KIT WITH 'JET'

Available Now Free for Qualified Educators!

Co-developed by Prof. John Seng (CalPoly) and NVIDIA

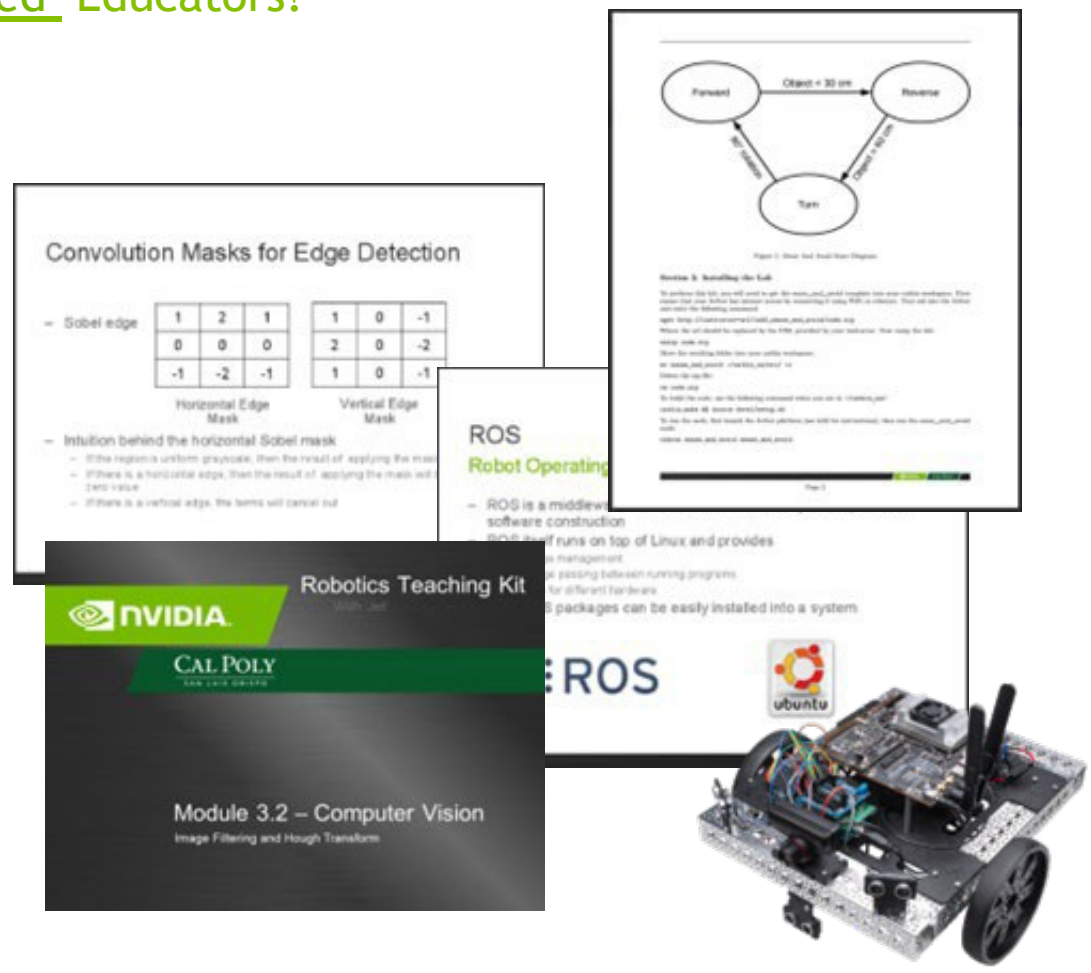
Comprehensive teaching materials:

- Lecture slides
- Hands-on labs/solutions
- Quiz/exam problem sets/solutions
- Open-ended coding projects

Robot hardware kit via Build of Materials (BOM):

- NVIDIA Jetson TX1 and TX2 support
- All mechanical, chassis, electronics parts
- Jetson Nano content also available from NVIDIA

developer.nvidia.com/teaching-kits



ROBOTICS TEACHING KIT WITH 'JET'

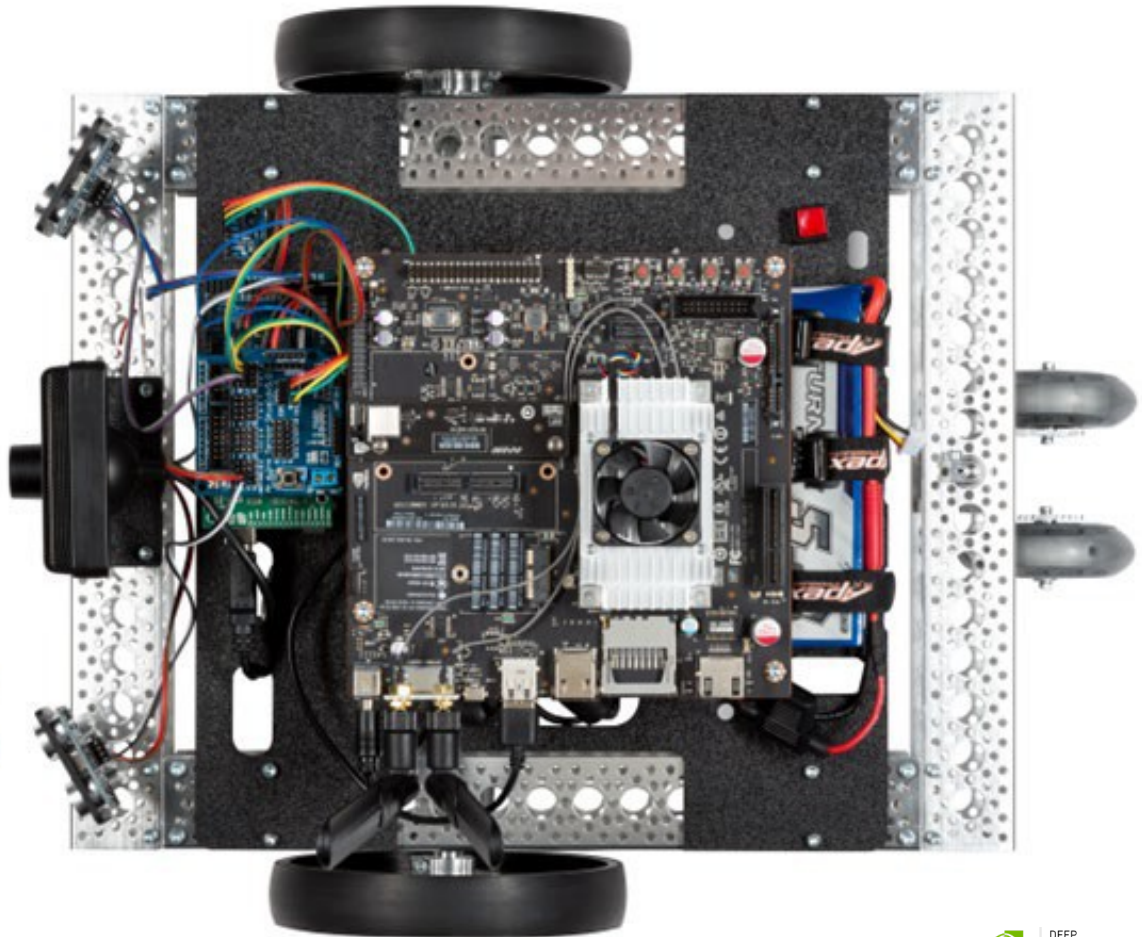
Module Goals

Learn interdisciplinary, GPU-accelerated, autonomous Robotics

Technical subjects

- Sensors
- Computer Vision
- Machine Learning
- Dead Reckoning
- Path Planning
- Localization
- Control
- Obstacle Avoidance

ROS



DATA SCIENCE TEACHING KIT RFP OUT

Seeking proposals from development partner PIs

Intro to DS course based on RAPIDS(https://rapids.ai/)/GPUs

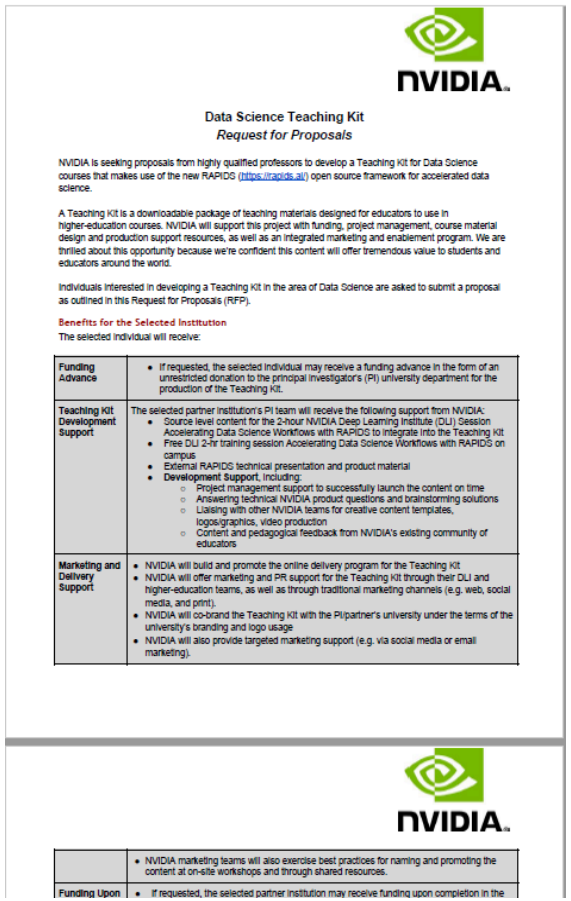
Funding requirements/model

Timeline

Suggested module topics

Content types (slides, labs, notebooks, videos, etc.)

Email jbungo@nvidia.com for information



NVIDIA

Data Science Teaching Kit

Request for Proposals

NVIDIA is seeking proposals from highly qualified professors to develop a Teaching Kit for Data Science courses that makes use of the new RAPIDS (https://rapids.ai/) open source framework for accelerated data science.

A Teaching Kit is a downloadable package of teaching materials designed for educators to use in higher-education courses. NVIDIA will support this project with funding, project management, course material design and production support resources, as well as an integrated marketing and enablement program. We are thrilled about this opportunity because we're confident this content will offer tremendous value to students and educators around the world.

Individuals interested in developing a Teaching Kit in the area of Data Science are asked to submit a proposal as outlined in this Request for Proposals (RFP).

Benefits for the Selected Institution

The selected individual will receive:

Funding Advance	• If requested, the selected individual may receive a funding advance in the form of an unrestricted donation to the principal investigator's (PI) university department for the production of the Teaching Kit.
Teaching Kit Development Support	The selected partner institution's PI team will receive the following support from NVIDIA: • Source level content for the 2-hour NVIDIA Deep Learning Institute (DLI) Session Accelerating Data Science Workflows with RAPIDS to integrate into the Teaching Kit • Free DLI 2-hr training session Accelerating Data Science Workflows with RAPIDS on campus • External RAPIDS technical presentation and product material • **Development Support**, including: ○ Project management support to successfully launch the content on time ○ Answering technical NVIDIA product questions and brainstorming solutions ○ Liaising with other NVIDIA teams for creative content templates, logos/graphics, video production ○ Content and pedagogical feedback from NVIDIA's existing community of educators
Marketing and Delivery Support	• NVIDIA will build and promote the online delivery program for the Teaching Kit • NVIDIA will offer marketing and PR support for the Teaching Kit through their DLI and higher-education teams, as well as through traditional marketing channels (e.g. web, social media, and print). • NVIDIA will co-brand the Teaching Kit with the PI/partner's university under the terms of the university's branding and logo usage • NVIDIA will also provide targeted marketing support (e.g. via social media or email marketing).

NVIDIA

	• NVIDIA marketing teams will also exercise best practices for naming and promoting the content at on-site workshops and through shared resources.
Funding Upon	• If requested, the selected partner institution may receive funding upon completion in the

NEW EDGE AI/ROBOTICS TEACHING KIT RFP OUT

Seeking proposals from development partner PIs

Edge AI and Robotics course based on Jetson Nano: https://developer.nvidia.com/embedded/jetson-nano-developer-kit

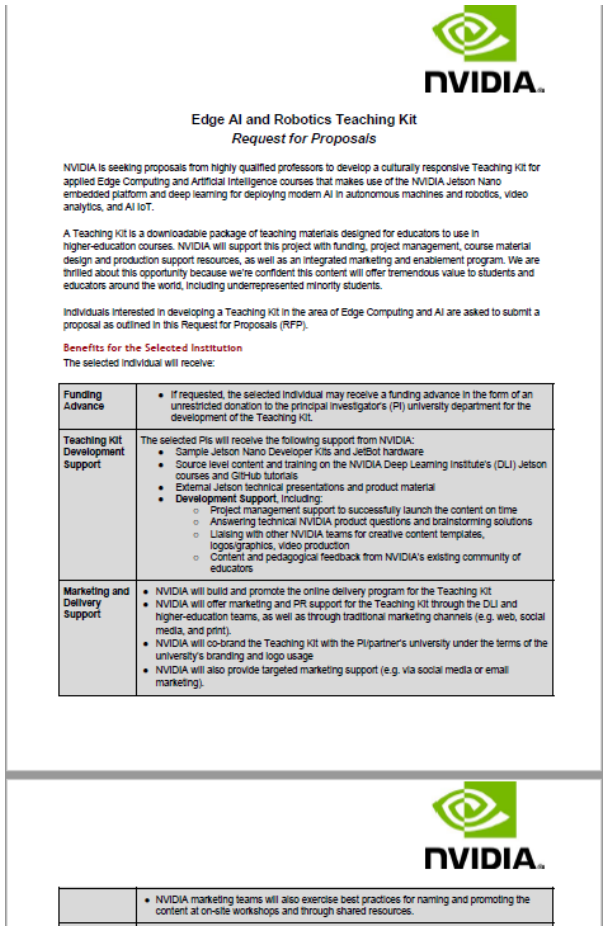
Funding requirements/model

Timeline

Suggested module topics

Content types (slides, labs, notebooks, videos, etc.)

Email jbungo@nvidia.com for information



NVIDIA

Edge AI and Robotics Teaching Kit

Request for Proposals

NVIDIA is seeking proposals from highly qualified professors to develop a culturally responsive Teaching Kit for applied Edge Computing and Artificial Intelligence courses that makes use of the NVIDIA Jetson Nano embedded platform and deep learning for deploying modern AI in autonomous machines and robotics, video analytics, and AI IoT.

A Teaching Kit is a downloadable package of teaching materials designed for educators to use in higher-education courses. NVIDIA will support this project with funding, project management, course material design and production support resources, as well as an integrated marketing and enablement program. We are thrilled about this opportunity because we're confident this content will offer tremendous value to students and educators around the world, including underrepresented minority students.

Individuals interested in developing a Teaching Kit in the area of Edge Computing and AI are asked to submit a proposal as outlined in this Request for Proposals (RFP).

Benefits for the Selected Institution

The selected individual will receive:

Funding Advance	• If requested, the selected individual may receive a funding advance in the form of an unrestricted donation to the principal investigator's (PI) university department for the development of the Teaching Kit.
Teaching Kit Development Support	The selected PIs will receive the following support from NVIDIA: • Sample Jetson Nano Developer Kits and JetBot hardware • Source level content and training on the NVIDIA Deep Learning Institute's (DLI) Jetson courses and GitHub tutorials • External Jetson technical presentations and product material • **Development Support**, including: ○ Project management support to successfully launch the content on time ○ Answering technical NVIDIA product questions and brainstorming solutions ○ Liaising with other NVIDIA teams for creative content templates, logos/graphics, video production ○ Content and pedagogical feedback from NVIDIA's existing community of educators
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NVIDIA

	• NVIDIA marketing teams will also exercise best practices for naming and promoting the content at on-site workshops and through shared resources.

DEEP LEARNING INSTITUTE

University Ambassador Program

Preparing today's students and researchers for tomorrow's AI computing challenges

Want to bring DLI to your campus?

DLI awards qualified educators as certified DLI Ambassadors, enabling them to teach free DLI content exclusively to university students and staff

DLI University Ambassadorship is an additional status on top of DLI Instructor Certification with additional benefits

Candidates should have relevant teaching and research/work experience, and most Ambassador invitations are sent to qualified educators who are part of the NVIDIA Teaching Kit program: developer.nvidia.com/teaching-kits

WHY BECOME A DLI AMBASSADOR?

DLI WORKSHOP AND CONTENT ENABLEMENT

- Bring free, world-class DL training to academic communities and conferences **(USD$500 value per student)**
- Proven, ready-made content and online training platform
- Off-set for event expenses, catering, and/or travel expenses **(up to USD$500 per event)**
- Access to workshop best practices and promotional assets via Ambassador Event Kit

TRAINING AND INSTRUCTOR CERTIFICATION AWARD

- Free DLI Instructor Certification **(USD$1000 value)**
- Recognized and certified as an applied DL expert by NVIDIA
- Formal inclusion in DLI University Ambassador and Certified Instructor programs

OTHER TEACHING RESOURCES

- Early access to DLI content, DLI Teaching Kits, and other cloud-based platforms complement your curriculum courses

NEW! OPPORTUNITY TO RUN PAID DLI TRAINING FOR INDUSTRY

- Ambassadors can purchase DLI workshops from NVIDIA at a discount and resell to industry and professional continuing education customers

INSTITUTIONS WITH AMBASSADORS

DLI University Ambassadors come from hundreds of institutions worldwide (some shown below)

DLI COURSE CONTENT USE-CASES FOR EDUCATORS

AMBASSADOR-LED WORKSHOP

Virtual classroom created by NVIDIA on DLI training platform

Full-day, instructor-led workshop and/or 2-hour+ pieces (students can complete at home as well)

Flexible venue (campus, academic conference, live online, etc.)

Requires Ambassadorship

ONLINE ASSIGNMENTS IN CURRICULUM COURSES

University educator shares special code with students (via Teaching Kit)

Students take course online, can email copy of certification to instructor

Does not require Ambassadorship

EDUCATOR-LED ONLINE COURSES

University educator shares special code with students (via Teaching Kit)

In-person walk-through of any DLI online, self-paced content with students, along with any supplemental material

Does not require Ambassadorship

GTC DIGITAL 2020 RECORDED SESSIONS FOR EDUCATORS

- **Bringing AI to the Classroom: NVIDIA's Deep Learning Teaching Kit** [S22357]
  Joe Bungo, DLI Program Manager, **NVIDIA**
  Pawel Morkisz, Assistant Professor, **AGH University of Science and Technology, Poland**

- **Accelerated Computing Teaching Kit for University Educators: Introduction and Use Cases** [S22414]
  Joe Bungo, DLI Program Manager, **NVIDIA**
  Adarsh Krishnamurthy, Assistant Professor, **Iowa State University**

- **Accelerating Data Science in the Classroom: Teaching Analytics and Machine Learning with RAPIDS** [S22417]
  Polo Chau, Associate Professor, **Georgia Institute of Technology**
  Haekyu Park, Ph.D. Student, **Georgia Institute of Technology**

Find these Sessions on demand at https://www.nvidia.com/en-us/gtc/on-demand/

MORE EDUCATOR SUCCESS STORIES!

- YouTube Video: *Enhancing Curricula with NVIDIA Teaching Kits*
  Sunita Chandrasekaran, Assistant Professor, **University of Delaware**
  Cristina Nader Vasconcelos, Assistant Professor **Universidad Federal Fluminense (UFF), Brazil**

- YouTube Video: *Furthering the Frontiers of Education*
  Jay Urbain, Professor, **Milwaukee School of Engineering (MSOE)**

- Developer Blog: *Why University Educators Are Pulling NVIDIA Teaching Kits into Their Classrooms*
  Daniel Wong, Assistant Professor, **University of California, Riverside**
  Samir Jabari, Researcher, **University Hospital Erlanger, Germany**
  Ashwin Ashok, Assistant Professor, **Georgia State University**

- On-Demand Webinar: *Bringing GPU Computing to Classroom*
  Zoran Kostic, Associate Professor, **Columbia University**
  Sunita Chandrasekaran, Assistant Professor, **University of Delaware**

- On-Demand Webinar: *How to Become an Ambassador for Deep Learning*
  Raymond Ptucha, Assistant Professor, **Rochester Institute of Technology (RIT)**
  Gregory Gutmann, Assistant Professor, **Tokyo Institute of Technology (Titech)**

- Ambassador Spotlight: Ray Ptucha
  Raymond Ptucha, Assistant Professor, **Rochester Institute of Technology (RIT)**

- Published Paper from Supercomputing 2018 - *Deep Learning by Doing: The NVIDIA Deep Learning Institute and University Ambassador Program*
  Xi Chen, Researcher, **University of Kentucky**
  Gregory Gutmann, Assistant Professor, **Tokyo Institute of Technology (Titech)**

WHAT'S NEXT

ONLINE COURSES CODE: DLITEACH0920_12_XKP_93

GET THE BASICS

Watch "Deep Learning and Beyond"

Listen to the NVIDIA AI Podcast

Review examples of AI in action

LEARN WITH DLI

Take a self-paced online training at www.nvidia.com/dli

Request an onsite or remote workshop through your account manager.

APPLY FOR DLI INSTRUCTOR CERTIFICATION/AMBASSADORSHIP

Sign up for the NVIDIA Developer Program at https://developer.nvidia.com/dli/cip

UNIVERSITY RESOURCES

Download DLI Teaching Kits for complete course solutions across Deep Learning, Robotics, and Accelerated Computing.

Visit https://developer.nvidia.com/teaching-kits for more info.

Contact us at mgmilanova@ualr.edu and friedhelm.schwenker@uni-ulm.de