



Google IT Automation Professional Certificate

ISSUED TO

Akash Singh



Issued on: 18 AUG 2020 | Issued by: Coursera
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07/21/2020

Akash Singh

has successfully completed

Crash Course on Python

an online non-credit course authorized by Google and offered through Coursera



Google

COURSE CERTIFICATE



Verify at coursera.org/verify/GTSK88Z2ML92

Coursera has confirmed the identity of this individual and
their participation in the course.



07/22/2020

Akash Singh

has successfully completed

Using Python to Interact with the Operating System

an online non-credit course authorized by Google and offered through Coursera



Google

COURSE CERTIFICATE



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Coursera has confirmed the identity of this individual and
their participation in the course.



07/23/2020

Akash Singh

has successfully completed

Introduction to Git and GitHub

an online non-credit course authorized by Google and offered through Coursera



Google

COURSE CERTIFICATE



Verify at coursera.org/verify/JTHLWB53ZHE8

Coursera has confirmed the identity of this individual and
their participation in the course.



07/23/2020

Akash Singh

has successfully completed

Troubleshooting and Debugging Techniques

an online non-credit course authorized by Google and offered through Coursera



Google

COURSE CERTIFICATE



Verify at coursera.org/verify/REG8989U97NW

Coursera has confirmed the identity of this individual and
their participation in the course.



07/23/2020

Akash Singh

has successfully completed

Configuration Management and the Cloud

an online non-credit course authorized by Google and offered through Coursera



Google

COURSE CERTIFICATE



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Coursera has confirmed the identity of this individual and
their participation in the course.



07/24/2020

Akash Singh

has successfully completed

Automating Real-World Tasks with Python

an online non-credit course authorized by Google and offered through Coursera

Google

Google

COURSE CERTIFICATE



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Coursera has confirmed the identity of this individual and
their participation in the course.



6 Courses

Crash Course on Python

Using Python to Interact with the Operating System

Introduction to Git and GitHub

Troubleshooting and Debugging Techniques

Configuration Management and the Cloud

Automating Real-World Tasks with Python



07/24/2020

Akash Singh

has successfully completed the online, non-credit Professional Certificate

Google IT Automation with Python

This six-course certificate, developed by Google, is designed to provide IT professionals with in-demand skills -- including Python, Git, and IT automation -- that can help them advance their careers. The hands-on curriculum is designed to teach learners how to write code in Python, with a special focus on how this applies to automating tasks in the world of IT support and systems administration. Those who received this certificate passed all graded assessments with a score of 80% or above. They should have a strong foundation in how to use Git and GitHub, troubleshoot and debug complex problems, and apply automation at scale by using configuration management and the Cloud in order to prepare them for more advanced IT Support Specialist or Junior Systems Administrator positions.

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

A small, semi-transparent watermark of the Google logo is located in the upper right corner of the certificate.

Verify this certificate at:
coursera.org/verify/professional-cert/PJJHFX7ERUEW



Google IT Support Professional Certificate

ISSUED TO

Akash Singh



Issued on: 27 JUL 2020 | Issued by: Coursera
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07/26/2020

Akash Singh

has successfully completed

Technical Support Fundamentals

an online non-credit course authorized by Google and offered through Coursera



Google

COURSE CERTIFICATE



Verify at coursera.org/verify/LUS9S7774G73

Coursera has confirmed the identity of this individual and
their participation in the course.



07/27/2020

Akash Singh

has successfully completed

The Bits and Bytes of Computer Networking

an online non-credit course authorized by Google and offered through Coursera



Google

COURSE CERTIFICATE



Verify at coursera.org/verify/ANE6CU5XEEUH
Coursera has confirmed the identity of this individual and
their participation in the course.



07/26/2020

Akash Singh

has successfully completed

Operating Systems and You: Becoming a Power User

an online non-credit course authorized by Google and offered through Coursera



Google

COURSE CERTIFICATE



Verify at coursera.org/verify/DCSGSPBHLKKN

Coursera has confirmed the identity of this individual and
their participation in the course.



07/27/2020

Akash Singh

has successfully completed

System Administration and IT Infrastructure Services

an online non-credit course authorized by Google and offered through Coursera



Google

COURSE CERTIFICATE



Verify at coursera.org/verify/6K26KYRF7VLQ

Coursera has confirmed the identity of this individual and
their participation in the course.



07/26/2020

Akash Singh

has successfully completed

IT Security: Defense against the digital dark arts

an online non-credit course authorized by Google and offered through Coursera



Google

COURSE CERTIFICATE



Verify at coursera.org/verify/6YUL3TKE7S9H

Coursera has confirmed the identity of this individual and
their participation in the course.



5 Courses



07/27/2020

Akash Singh

has successfully completed the online, non-credit Professional Certificate

Technical Support Fundamentals

The Bits and Bytes of Computer Networking

Operating Systems and You: Becoming a Power User

System Administration and IT Infrastructure Services

IT Security: Defense against the digital dark arts

Google

Google

Google IT Support

Whether you've been tinkering with IT or are completely new to the field, you've come to the right place. This five-course certificate, developed by Googlers, includes industry-relevant curriculum designed to prepare you for an entry-level role in IT support. Think in-person or remote help desk work, either in small shops or at a global company, like Google!

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

Verify this certificate at:
coursera.org/verify/professional-cert/66HX2T358RM6



07/28/2020

Akash Singh

has successfully completed

How Google does Machine Learning

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/72HMBV93GRJJ

Coursera has confirmed the identity of this individual and
their participation in the course.



07/28/2020

Akash Singh

has successfully completed

Launching into Machine Learning

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/2SRL3WU59KXJ

Coursera has confirmed the identity of this individual and
their participation in the course.



07/28/2020

Akash Singh

has successfully completed

Intro to TensorFlow

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/45DP6HKP5ZH

Coursera has confirmed the identity of this individual and
their participation in the course.



08/01/2020

Akash Singh

has successfully completed

Feature Engineering

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/P6WPD4HLH3ZS

Coursera has confirmed the identity of this individual and
their participation in the course.



08/01/2020

Akash Singh

has successfully completed

Art and Science of Machine Learning

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/FGLW2QAMZ9HJ
Coursera has confirmed the identity of this individual and
their participation in the course.



5 Courses

How Google does Machine Learning

Launching into Machine Learning

Introduction to TensorFlow

Feature Engineering

Art and Science of Machine Learning

Google Cloud

08/01/2020

Akash Singh

has successfully completed the online, non-credit Specialization

Google Cloud Training

Machine Learning with TensorFlow on Google Cloud Platform

This five-course online specialization teaches course participants how to write distributed machine learning models that scale in Tensorflow, scale out the training of those models, and offer high-performance predictions. Also featured is the conversion of raw data to features in a way that allows ML to learn important characteristics from the data and bring human insight to bear on the problem. It also teaches how to incorporate the right mix of parameters that yields accurate, generalized models and knowledge of the theory to solve specific types of ML problems. Course participants experimented with end-to-end ML, starting from building an ML-focused strategy and progressing into model training, optimization, and productionalization with hands-on labs using Google Cloud Platform.

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Verify this certificate at:
coursera.org/verify/specialization/7P4GQCT6PH6G



08/02/2020

Akash Singh

has successfully completed

End-to-End Machine Learning with TensorFlow
on GCP

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/KQS8YE63UZ77

Coursera has confirmed the identity of this individual and
their participation in the course.



08/03/2020

Akash Singh

has successfully completed

Production Machine Learning Systems

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/PRLTYY7GD9MB

Coursera has confirmed the identity of this individual and
their participation in the course.



08/05/2020

Akash Singh

has successfully completed

Image Understanding with TensorFlow on GCP

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/LQ59RHVJ33F3

Coursera has confirmed the identity of this individual and
their participation in the course.



08/06/2020

Akash Singh

has successfully completed

Sequence Models for Time Series and Natural Language Processing

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/WFA6J7WHB3VM

Coursera has confirmed the identity of this individual and their participation in the course.



08/05/2020

Akash Singh

has successfully completed

Recommendation Systems with TensorFlow on
GCP

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/KNXWKNQCJQF3

Coursera has confirmed the identity of this individual and
their participation in the course.



5 Courses

End-to-End Machine Learning
with TensorFlow on GCP

Production Machine Learning
Systems

Image Understanding with
TensorFlow on GCP

Sequence Models for Time
Series and Natural Language
Processing

Recommendation Systems with
TensorFlow on GCP

Google Cloud

08/06/2020

Akash Singh

has successfully completed the online, non-credit Specialization

Advanced Machine Learning with TensorFlow on Google Cloud Platform

This specialization focuses on advanced machine learning topics using Google Cloud Platform where you will get hands-on experience optimizing, deploying, and scaling production ML models of various types in hands-on labs. This specialization picks up where "Machine Learning on GCP" left off and teaches you how to build scalable, accurate, and production-ready models for structured data, image data, time-series, and natural language text. It ends with a course on building recommendation systems. Topics introduced in earlier courses are referenced in later courses, so it is recommended that you take the courses in exactly this order.

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

Google Cloud Training

Google Cloud Training

Verify this certificate at:
coursera.org/verify/specialization/E6MWELZB23U2



07/27/2020

Akash Singh

has successfully completed

Google Cloud Platform Big Data and Machine Learning Fundamentals

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/QT9RGRGDG7J9

Coursera has confirmed the identity of this individual and their participation in the course.



08/31/2020

Akash Singh

has successfully completed

Modernizing Data Lakes and Data Warehouses
with GCP

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/RUD28USQRPQB

Coursera has confirmed the identity of this individual and
their participation in the course.



09/04/2020

Akash Singh

has successfully completed

Building Batch Data Pipelines on GCP

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/A9Q9HCK4P3V7

Coursera has confirmed the identity of this individual and
their participation in the course.

09/05/2020

Akash Singh

has successfully completed

Building Resilient Streaming Analytics Systems on
GCP

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/S8X9WMAH4GJP
Coursera has confirmed the identity of this individual and
their participation in the course.

09/05/2020

Akash Singh

has successfully completed

Smart Analytics, Machine Learning, and AI on GCP

an online non-credit course authorized by Google Cloud and offered through Coursera

Google Cloud Training

COURSE CERTIFICATE



Verify at coursera.org/verify/27C48UAZ8JW7

Coursera has confirmed the identity of this individual and
their participation in the course.



5 Courses

Google Cloud Platform Big Data and Machine Learning Fundamentals

Modernizing Data Lakes and Data Warehouses with GCP

Building Batch Data Pipelines on GCP

Building Resilient Streaming Analytics Systems on GCP

Smart Analytics, Machine Learning, and AI on GCP

Google Cloud

26.09.2020

Akash Singh

has successfully completed the online, non-credit Specialization

Data Engineering, Big Data, and Machine Learning on GCP

This five-course accelerated specialization is designed for data professionals who are responsible for designing, building, analyzing, and optimizing big data solutions. Through a combination of video lectures, quizzes, and hands-on labs, learners carried out serverless data analysis and productionize machine learning models. This specialization is designed to give learners a robust hands-on experience and is primarily lab-focused.

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

Google Cloud Training

Google Cloud Training

Verify this certificate at:
coursera.org/verify/specialization/78ZVUEHAU5H5



Daydream

09/07/2020

Akash Singh

has successfully completed

Introduction to Augmented Reality and ARCore

an online non-credit course authorized by Google AR & VR and offered through Coursera

Google Daydream Impact

COURSE CERTIFICATE



Verify at coursera.org/verify/Y4L2W6DGVQRF

Coursera has confirmed the identity of this individual and their participation in the course.



08/22/2020

Akash Singh

has successfully completed

AWS Fundamentals: Going Cloud-Native

an online non-credit course authorized by Amazon Web Services and offered through Coursera

Allen Goldberg, Morgan Willis, Blaine Sundrud
AWS Training and Certification

COURSE CERTIFICATE



Verify at coursera.org/verify/V6LLJVLKSEWZ

Coursera has confirmed the identity of this individual and
their participation in the course.



08/23/2020

Akash Singh

has successfully completed

AWS Fundamentals: Addressing Security Risk

an online non-credit course authorized by Amazon Web Services and offered through Coursera

A handwritten signature of the name "Akash Singh".

A handwritten signature of the name "Nayan Jha".

COURSE CERTIFICATE



Verify at coursera.org/verify/V2A8P8SRQMT9

Coursera has confirmed the identity of this individual and
their participation in the course.



08/22/2020

Akash Singh

has successfully completed

AWS Fundamentals: Migrating to the Cloud

an online non-credit course authorized by Amazon Web Services and offered through Coursera

Cloud Technologist

Technical Architect

COURSE CERTIFICATE



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Coursera has confirmed the identity of this individual and
their participation in the course.



08/22/2020

Akash Singh

has successfully completed

AWS Fundamentals: Building Serverless Applications

an online non-credit course authorized by Amazon Web Services and offered through Coursera

Rick Hurst, Jonathan Dion, Adam Becker, Bobbie Aristrain, Wes Gruver

Rick Hurst, Jonathan Dion, Adam Becker, Bobbie Aristrain, Wes Gruver
AWS Training and Certification

COURSE CERTIFICATE



Verify at coursera.org/verify/2YSL6RCAA8CR

Coursera has confirmed the identity of this individual and
their participation in the course.



4 Courses



08/23/2020

Akash Singh

has successfully completed the online, non-credit Specialization

AWS Fundamentals

AWS Fundamentals

In this Specialization, learners gained proficiency in essential concepts, services, and use cases within the Amazon Web Services (AWS) cloud ecosystem, including core AWS services and key AWS security concepts. The Specialization also covered fundamental strategies for planning and migrating existing workloads to AWS and how to build and deploy serverless applications with AWS. Learners are given opportunities to solidify their understanding by engaging in various hands-on labs and exercises throughout the Specialization.

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

Verify this certificate at:
coursera.org/verify/specialization/VT3G3J4BLHL8



08/22/2020

Akash Singh

has successfully completed

Getting Started with AWS Machine Learning

an online non-credit course authorized by Amazon Web Services and offered through Coursera

Blaine Sundrud
Senior Technical Trainer
AWS Training and Certification

COURSE CERTIFICATE



Verify at coursera.org/verify/SZ3Z53TRT8FZ

Coursera has confirmed the identity of this individual and
their participation in the course.



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY

08/23/2020

Akash Singh

has successfully completed

Algorithmic Toolbox

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera

Alexander S. Kulikov, Visiting Professor; Michael Levin, Associate Professor; Neil Rhodes, Adjunct Faculty; Pavel A. Pevzner, Ronald R. Taylor Distinguished Professor of Computer Science, Director, NIH Center for Computational Mass Spectrometry; Daniel M Kane, Assistant Professor, Computer Science and Engineering at the University of California, San Diego

COURSE CERTIFICATE



Verify at coursera.org/verify/CBUTJWKWSDKX

Coursera has confirmed the identity of this individual and their participation in the course.



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY

08/23/2020

Akash Singh

has successfully completed

Data Structures

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera

Alexander S. Kulikov, Visiting Professor; Michael Levin, Associate Professor; Neil Rhodes, Adjunct Faculty; Daniel M Kane, Assistant Professor, Computer Science and Engineering at the University of California, San Diego

COURSE CERTIFICATE



Verify at coursera.org/verify/388WWT5WHKQF
Coursera has confirmed the identity of this individual and
their participation in the course.



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY

08/23/2020

Akash Singh

has successfully completed

Algorithms on Graphs

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera

Alexander S. Kulikov, Michael Levin, Neil Rhodes, Daniel M. Kane, Daniel M. Kane

Alexander S. Kulikov, Visiting Professor; Michael Levin, Associate Professor; Neil Rhodes, Adjunct Faculty; Daniel M. Kane, Assistant Professor, Computer Science and Engineering at the University of California, San Diego

COURSE CERTIFICATE



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Coursera has confirmed the identity of this individual and
their participation in the course.



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY

08/24/2020

Akash Singh

has successfully completed

Algorithms on Strings

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera

Alexander S. Kulikov, Visiting Professor; Michael Levin, Associate Professor; Pavel A. Pevzner, Ronald R. Taylor
Distinguished Professor of Computer Science, Director, NIH Center for Computational Mass Spectrometry; Neil
Rhodes, Adjunct Faculty
Department of Computer Science and Engineering
University of California, San Diego

COURSE CERTIFICATE



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Coursera has confirmed the identity of this individual and
their participation in the course.



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY

08/23/2020

Akash Singh

has successfully completed

Advanced Algorithms and Complexity

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera

Alexander S. Kulikov, Visiting Professor; Michael Levin, Associate Professor; Neil Rhodes, Adjunct Faculty; Daniel M Kane, Assistant Professor, Computer Science and Engineering at the University of California, San Diego

COURSE CERTIFICATE



Verify at coursera.org/verify/XQHMYAHCW7JC
Coursera has confirmed the identity of this individual and
their participation in the course.



HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY

08/23/2020

Akash Singh

has successfully completed

Genome Assembly Programming Challenge

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera



Alexander S. Kulikov, Visiting Professor; Michael Levin, Associate Professor; Neil Rhodes, Adjunct Faculty; Daniel M. Kane, Assistant Professor, Computer Science and Engineering at the University of California, San Diego

COURSE CERTIFICATE



Verify at coursera.org/verify/9B4QUTEE2QSC

Coursera has confirmed the identity of this individual and their participation in the course.



6 Courses

Algorithmic Toolbox
Data Structures
Algorithms on Graphs
Algorithms on Strings
Advanced Algorithms and Complexity
Genome Assembly Programming Challenge



08/24/2020

Akash Singh

has successfully completed the online, non-credit Specialization

Data Structures and Algorithms

In this Specialization, learners developed and honed essential skills in developing fast and reliable programs. Learners studied theoretical aspects of basic algorithms as well as solved many programming assignments where the goal is to implement a program solving a given computational problem correctly and quickly. Learners completed a Capstone Project at the end of the Specialization to apply their new knowledge and skills.

A cluster of five handwritten signatures in black ink, including "Daniel Kane", "Alexander S. Kulikov", "Ph.D., Neil Rhodes", "Pavel Pevzner, Ph.D.", and "University of California, San Diego, Michael Levin, Higher School of Economics".

Daniel Kane, Ph.D.,
Alexander S. Kulikov,
Ph.D., Neil Rhodes, Pavel
Pevzner, Ph.D., University
of California, San Diego,
Michael Levin, Higher
School of Economics

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Verify this certificate at:
coursera.org/verify/specialization/ZZ33VZW4PCYH



28.09.2020

Akash Singh

has successfully completed

Mathematical Thinking in Computer Science

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera

Three handwritten signatures are shown in blue ink. From left to right: "Alexander S. Kulikov", "Michael Levin", and "Vladimir Podolskii".

Alexander S. Kulikov, Visiting Professor, Department of Computer Science and Engineering;
Michael Levin, Associate Professor, Computer Science;
Vladimir Podolskii, Associate Professor, Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/UFX4T2Z47KW8

Coursera has confirmed the identity of this individual and their participation in the course.



UC San Diego

HIGHER SCHOOL OF ECONOMICS
NATIONAL RESEARCH UNIVERSITY

28.09.2020

Akash Singh

has successfully completed

Combinatorics and Probability

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera

Alexander S. Kulikov
Visiting Professor
Department of Computer Science and Engineering

Vladimir Podolskii
Associate Professor
Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/YKNUUR6QB8S
Coursera has confirmed the identity of this individual and
their participation in the course.



28.09.2020

Akash Singh

has successfully completed

Introduction to Graph Theory

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera

A handwritten signature in black ink that appears to read "Alexander S. Kulikov".

Alexander S. Kulikov
Visiting Professor
Department of Computer Science and Engineering

COURSE CERTIFICATE



Verify at coursera.org/verify/2YQ5PVN8ZYEP

Coursera has confirmed the identity of this individual and their participation in the course.



28.09.2020

Akash Singh

has successfully completed

Number Theory and Cryptography

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera

Three handwritten signatures are shown in blue ink. From left to right: Alexander S. Kulikov, Michael Levin, and Vladimir Podolskii.

Alexander S. Kulikov, Visiting Professor, Department of Computer Science and Engineering;
Michael Levin, Associate Professor, Computer Science;
Vladimir Podolskii, Associate Professor, Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/JRGDJ86JL39Y

Coursera has confirmed the identity of this individual and their participation in the course.



28.09.2020

Akash Singh

has successfully completed

Delivery Problem

an online non-credit course authorized by University of California San Diego and National Research University Higher School of Economics and offered through Coursera

A handwritten signature in black ink, appearing to read "Alexander S. Kulikov".

Alexander S. Kulikov
Visiting Professor
Department of Computer Science and Engineering

COURSE CERTIFICATE



Verify at coursera.org/verify/Z35LRZEZ4PY5

Coursera has confirmed the identity of this individual and their participation in the course.



5 Courses

Mathematical Thinking in Computer Science

Combinatorics and Probability

Introduction to Graph Theory

Number Theory and Cryptography

Delivery Problem



28.09.2020

Akash Singh

has successfully completed the online, non-credit Specialization

Introduction to Discrete Mathematics for Computer Science

Discrete Math is needed to see mathematical structures in the object you work with, and understand their properties. This ability is important for software engineers, data scientists, security and financial analysts (it is not a coincidence that math puzzles are often used for interviews). We cover the basic notions and results (combinatorics, graphs, probability, number theory) that are universally needed.

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A handwritten signature in blue ink that reads "Vladimir Podolskii".

Vladimir Podolskii
Associate Professor
Computer Science

A handwritten signature in blue ink that reads "Michael Levin".

Michael Levin
Lecturer
Computer Science

A handwritten signature in blue ink that reads "Alexander S. Kulikov".

Alexander S. Kulikov
Visiting Professor
Department of
Computer Science and
Engineering

Verify this certificate at:
coursera.org/verify/specialization/XFXTUKJJPT9S



UC San Diego

26.09.2020

Akash Singh

has successfully completed

Learning How to Learn: Powerful mental tools to help you master tough subjects

an online non-credit course authorized by McMaster University and University of California San Diego and offered through Coursera

Barbara A. Oakley

Terry Sejnowski

Barb Oakley
Terry Sejnowski

COURSE CERTIFICATE



Verify at coursera.org/verify/6U3997KD6LS2

Coursera has confirmed the identity of this individual and their participation in the course.



23.09.2020

Akash Singh

has successfully completed

Mastering the Software Engineering Interview

an online non-credit course authorized by University of California San Diego and offered through Coursera

Christine Alvarado, Mia Minnes, Leo Porter

Associate Teaching Professor, Assistant Teaching Professor, Assistant Teaching Professor
Computer Science and Engineering

COURSE CERTIFICATE



Verify at coursera.org/verify/WR389ELC59ZA

Coursera has confirmed the identity of this individual and their participation in the course.



26.09.2020

Akash Singh

has successfully completed

The Science of Well-Being

an online non-credit course authorized by Yale University and offered through
Coursera


Laurie Santos
Professor
Psychology

COURSE CERTIFICATE



Verify at coursera.org/verify/GG64TP746ATM

Coursera has confirmed the identity of this individual and
their participation in the course.



08/24/2020

Akash Singh

has successfully completed

Neural Networks and Deep Learning

an online non-credit course authorized by deeplearning.ai and offered through Coursera

A handwritten signature in blue ink that reads "Andrew Ng".

Adjunct Professor Andrew Ng
Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/FYSUET7NBAAV

Coursera has confirmed the identity of this individual and
their participation in the course.



08/25/2020

Akash Singh

has successfully completed

Improving Deep Neural Networks:
Hyperparameter tuning, Regularization and
Optimization

an online non-credit course authorized by deeplearning.ai and offered through
Coursera

A handwritten signature in blue ink that appears to read "Andrew Ng".

Adjunct Professor Andrew Ng
Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/4NX6KNL65BVS

Coursera has confirmed the identity of this individual and
their participation in the course.



08/25/2020

Akash Singh

has successfully completed

Structuring Machine Learning Projects

an online non-credit course authorized by deeplearning.ai and offered through Coursera

A handwritten signature in blue ink that reads "Andrew Ng".

Adjunct Professor Andrew Ng
Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/SRSHH8XTKMN6

Coursera has confirmed the identity of this individual and
their participation in the course.



08/26/2020

Akash Singh

has successfully completed

Convolutional Neural Networks

an online non-credit course authorized by deeplearning.ai and offered through
Coursera

A handwritten signature in blue ink that reads "Andrew Ng".

Adjunct Professor Andrew Ng
Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/QPBKGUZV3TJD

Coursera has confirmed the identity of this individual and
their participation in the course.



08/26/2020

Akash Singh

has successfully completed

Sequence Models

an online non-credit course authorized by deeplearning.ai and offered through
Coursera

A handwritten signature in blue ink that reads "Andrew Ng".

Adjunct Professor Andrew Ng
Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/JP5Y8VH696RV

Coursera has confirmed the identity of this individual and
their participation in the course.



5 Courses

Neural Networks and Deep Learning

Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization

Structuring Machine Learning Projects

Convolutional Neural Networks

Sequence Models



08/26/2020

Akash Singh

has successfully completed the online, non-credit Specialization

Deep Learning

The Deep Learning Specialization is designed to prepare learners to participate in the development of cutting-edge AI technology, and to understand the capability, the challenges, and the consequences of the rise of deep learning. Through five interconnected courses, learners develop a profound knowledge of the hottest AI algorithms, mastering deep learning from its foundations (neural networks) to its industry applications (Computer Vision, Natural Language Processing, Speech Recognition, etc.).

A handwritten blue ink signature of the name "Andrew Ng".

Adjunct Professor
Andrew Ng
Computer Science

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

Verify this certificate at:
coursera.org/verify/specialization/QVRRAVTN2JEV



08/25/2020

Akash Singh

has successfully completed

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

an online non-credit course authorized by deeplearning.ai and offered through Coursera

Laurence Moroney

Laurence Moroney
Staff AI Advocate
Google Brain

COURSE CERTIFICATE



Verify at coursera.org/verify/6N4X26JFP2LC

Coursera has confirmed the identity of this individual and their participation in the course.



08/30/2020

Akash Singh

has successfully completed

Convolutional Neural Networks in TensorFlow

an online non-credit course authorized by deeplearning.ai and offered through
Coursera

Laurence Moroney

Laurence Moroney
Staff AI Advocate
Google Brain

COURSE CERTIFICATE



Verify at coursera.org/verify/ULYPBHDLB7G9

Coursera has confirmed the identity of this individual and
their participation in the course.



08/30/2020

Akash Singh

has successfully completed

Natural Language Processing in TensorFlow

an online non-credit course authorized by deeplearning.ai and offered through
Coursera

Laurence Moroney

Laurence Moroney
Staff AI Advocate
Google Brain

COURSE CERTIFICATE



Verify at coursera.org/verify/SNYCLD79J7SW

Coursera has confirmed the identity of this individual and
their participation in the course.



08/30/2020

Akash Singh

has successfully completed

Sequences, Time Series and Prediction

an online non-credit course authorized by deeplearning.ai and offered through Coursera

Laurence Moroney

Laurence Moroney
Staff AI Advocate
Google Brain

COURSE CERTIFICATE



Verify at coursera.org/verify/7R9U6GHK9HQ6

Coursera has confirmed the identity of this individual and
their participation in the course.



4 Courses

Introduction to TensorFlow for Artificial Intelligence, Machine Learning, and Deep Learning

Convolutional Neural Networks in TensorFlow

Natural Language Processing in TensorFlow

Sequences, Time Series and Prediction



08/30/2020

Akash Singh

has successfully completed the online, non-credit Professional Certificate

DeepLearning.AI TensorFlow Developer

Congratulations! You have completed all 4 courses of the DeepLearning.AI TensorFlow Developer Professional Certificate program. As part of this Professional Certificate program, you have learned: how to build and train neural networks using TensorFlow, how to improve network performance using convolutions as you train it to identify real-world images, how to teach machines to understand, analyze, and respond to human speech with natural language processing systems, and more! These, and other TensorFlow concepts, are going to be at the forefront of the coming transformation to an AI-powered future.

Laurence Moroney is an
AI Advocate at Google
Research

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

Verify this certificate at:
coursera.org/verify/professional-cert/298C3LEJKJJQ



08/29/2020

Akash Singh

has successfully completed

Natural Language Processing with Classification and Vector Spaces

an online non-credit course authorized by deeplearning.ai and offered through
Coursera

Younes Bensouda Mourri Lukasz Kaiser

Younes Bensouda Mourri, Instructor of AI at Stanford University

Lukasz Kaiser, Staff Research Scientist at Google Brain and Chargé de Recherche at CNRS

COURSE CERTIFICATE



Verify at coursera.org/verify/DUZA3J5ZGMR9

Coursera has confirmed the identity of this individual and
their participation in the course.



08/29/2020

Akash Singh

has successfully completed

Natural Language Processing with Probabilistic Models

an online non-credit course authorized by deeplearning.ai and offered through Coursera

Younes Bensouda Mourri Lukasz Kaiser

Younes Bensouda Mourri, Instructor of AI at Stanford University

Lukasz Kaiser, Staff Research Scientist at Google Brain and Chargé de Recherche at CNRS

COURSE CERTIFICATE



Verify at coursera.org/verify/XKG28XHSL989

Coursera has confirmed the identity of this individual and their participation in the course.



09/05/2020

Akash Singh

has successfully completed

Natural Language Processing with Sequence Models

an online non-credit course authorized by deeplearning.ai and offered through Coursera

Younes Bensouda Mourri Lukasz Kaiser

Younes Bensouda Mourri, Instructor of AI at Stanford University
Lukasz Kaiser, Staff Research Scientist at Google Brain and Chargé de Recherche at CNRS

COURSE CERTIFICATE



Verify at coursera.org/verify/DRPXB6EZS3FV

Coursera has confirmed the identity of this individual and their participation in the course.



25.09.2020

Akash Singh

has successfully completed

Natural Language Processing with Attention Models

an online non-credit course authorized by deeplearning.ai and offered through Coursera

Younes Bensouda Mourri Lukasz Kaiser

Younes Bensouda Mourri, Instructor of AI at Stanford University

Lukasz Kaiser, Staff Research Scientist at Google Brain and Chargé de Recherche at CNRS

COURSE CERTIFICATE



Verify at coursera.org/verify/39GA4CSSJN4X

Coursera has confirmed the identity of this individual and their participation in the course.



4 Courses

Natural Language Processing
with Classification and Vector
Spaces

Natural Language Processing
with Probabilistic Models

Natural Language Processing
with Sequence Models

Natural Language Processing
with Attention Models



25.09.2020

Akash Singh

has successfully completed the online, non-credit Specialization

Natural Language Processing

Congratulations! You have completed all four courses of Natural Language Processing – a deeplearning.ai Specialization. As part of this Specialization, you have learned the classical machine learning skills and the state-of-the-art deep learning techniques needed to build NLP systems. You are now equipped to design applications that perform question-answering and sentiment analysis, create tools to translate languages and summarize text, and build chatbots! These, and other NLP applications, are going to be at the forefront of the coming transformation to an AI-powered future.

Younes Bensouda Mourri Łukasz Kaiser

Younes Bensouda
Mourri
Instructor of AI at
Stanford University

Łukasz Kaiser
Staff Research Scientist
at Google and Chargé
de Recherche at CNRS

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

Verify this certificate at:
coursera.org/verify/specialization/7DP7EJJUGCK6



deeplearning.ai

18 Jan, 2021

Akash Singh

has successfully completed

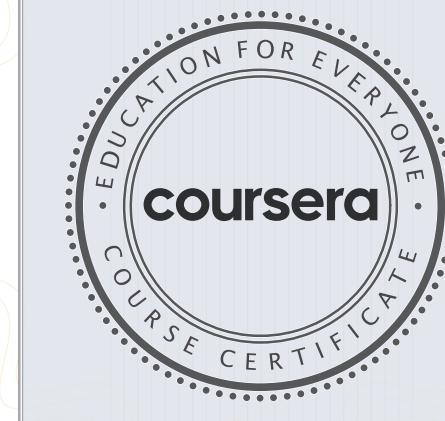
Build Basic Generative Adversarial Networks (GANs)

an online non-credit course authorized by DeepLearning.AI and offered through Coursera

A handwritten signature in black ink that appears to read "Akash Singh".

Sharon Zhou, Course Instructor, DeepLearning.AI
Eda Zhou, Curriculum Developer, DeepLearning.AI
Eric Zelikman, Curriculum Developer, DeepLearning.AI

COURSE CERTIFICATE



Verify at coursera.org/verify/LSY2LHSNNVYG

Coursera has confirmed the identity of this individual and their participation in the course.



08/24/2020

Akash Singh

has successfully completed

AI For Everyone

an online non-credit course authorized by deeplearning.ai and offered through
Coursera

A handwritten signature in blue ink that reads "Andrew Ng".

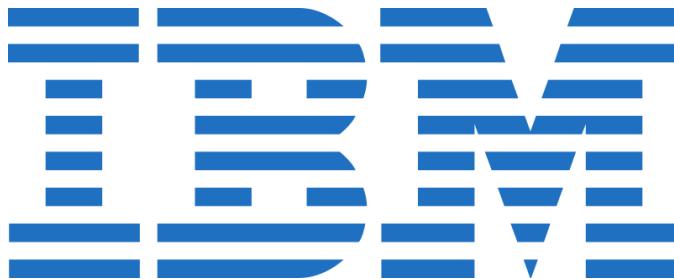
Adjunct Professor Andrew Ng
Computer Science Department
Stanford University

COURSE CERTIFICATE



Verify at coursera.org/verify/K5UT54E8S6G7

Coursera has confirmed the identity of this individual and
their participation in the course.



09/07/2020

Akash Singh

has successfully completed

Introduction to Artificial Intelligence (AI)

an online non-credit course authorized by IBM and offered through Coursera

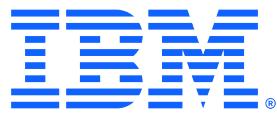
A handwritten signature in black ink.

Rav Ahuja
AI & Data Science Program Director
IBM Skills Network

COURSE CERTIFICATE



Verify at coursera.org/verify/CBATREAXB7AV
Coursera has confirmed the identity of this individual and
their participation in the course.



27.09.2020

Akash Singh

has successfully completed

Getting Started with AI using IBM Watson

an online non-credit course authorized by IBM and offered through Coursera

Rav Ahuja
AI & Data Science Program Director
IBM Skills Network

COURSE CERTIFICATE



Verify at coursera.org/verify/FSPB9NVNLLK6

Coursera has confirmed the identity of this individual and
their participation in the course.



Fundamentals of Scalable Data Science

ISSUED TO

Akash Singh



Issued on: 27 SEP 2020

Issued by: Coursera | Authorized by: IBM

Verify: <https://www.youracclaim.com/go/J796iRs0>



27.09.2020

Akash Singh

has successfully completed

Fundamentals of Scalable Data Science

an online non-credit course authorized by IBM and offered through Coursera

Romeo Kienzler
Chief Data Scientist
IBM Watson IoT

COURSE CERTIFICATE



Verify at coursera.org/verify/AR62MK4R5928

Coursera has confirmed the identity of this individual and
their participation in the course.



17 Apr, 2021

Akash Singh

has successfully completed

Introduction to Machine Learning

an online non-credit course authorized by Duke University and offered through Coursera

*Genevieve M. Lipp
David Carlson
Lawrence Carin*

Genevieve M. Lipp
David Carlson
Lawrence Carin

COURSE CERTIFICATE



Verify at coursera.org/verify/SF3VGNVKPGD

Coursera has confirmed the identity of this individual and their participation in the course.



08/21/2020

Akash Singh

has successfully completed

Facial Expression Recognition with Keras

an online non-credit course authorized by Coursera Project Network and offered through Coursera

Snehan Kekre
Instructor
Machine Learning and Data Science

COURSE CERTIFICATE



Verify at coursera.org/verify/XYEPNXGTCPZX
Coursera has confirmed the identity of this individual and
their participation in the course.



22.09.2020

Akash Singh

has successfully completed

Facial Expression Classification Using Residual Neural Nets

an online non-credit course authorized by Coursera Project Network and offered through Coursera

Ryan Ahmed

Ryan Ahmed
Adjunct Professor

COURSE CERTIFICATE



Verify at coursera.org/verify/Z3DFZDA8M7BW
Coursera has confirmed the identity of this individual and
their participation in the course.



22.09.2020

Akash Singh

has successfully completed

Emotion AI: Facial Key-points Detection

an online non-credit course authorized by Coursera Project Network and offered through Coursera

Ryan Ahmed

Ryan Ahmed
Adjunct Professor

COURSE CERTIFICATE



Verify at coursera.org/verify/9PNAHEU8H2KN
Coursera has confirmed the identity of this individual and
their participation in the course.



08/23/2020

Akash Singh

has successfully completed

Create a Python Application using MySQL

an online non-credit course authorized by Coursera Project Network and offered through Coursera

David Dalsveen

David Dalsveen
Subject Matter Expert
Freedom Learning Group

COURSE CERTIFICATE



Verify at coursera.org/verify/JYGMLXDK9CVS

Coursera has confirmed the identity of this individual and their participation in the course.



08/23/2020

Akash Singh

has successfully completed

Animation for Game Development Using PyGame

an online non-credit course authorized by Coursera Project Network and offered through Coursera

Kerri-Leigh Grady

Kerri-Leigh Grady
Subject Matter Expert
Freedom Learning Group

COURSE CERTIFICATE



Verify at coursera.org/verify/X57MYU7D3UAH

Coursera has confirmed the identity of this individual and their participation in the course.



09/04/2020

Akash Singh

has successfully completed

Create your own Sudoku Solver using AI and
Python

an online non-credit course authorized by Coursera Project Network and offered
through Coursera

Ahmed Elhelow

Ahmed Elhelow
Teaching Assistant
Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/9UPU7Q5E7GJ6

Coursera has confirmed the identity of this individual and
their participation in the course.



09/07/2020

Akash Singh

has successfully completed

Classify Radio Signals from Space using Keras

an online non-credit course authorized by Coursera Project Network and offered through Coursera

Snehan Kekre
Instructor
Machine Learning and Data Science

COURSE CERTIFICATE



Verify at coursera.org/verify/4R74LD3WJ7ZA
Coursera has confirmed the identity of this individual and
their participation in the course.



09/07/2020

Akash Singh

has successfully completed

Advanced Game Development Using PyGame

an online non-credit course authorized by Coursera Project Network and offered through Coursera

Kerri-Leigh Grady

Kerri-Leigh Grady
Subject Matter Expert
Freedom Learning Group

COURSE CERTIFICATE



Verify at coursera.org/verify/Q78Y5VU5XU9W
Coursera has confirmed the identity of this individual and
their participation in the course.



11 Sep, 2020

Akash Singh

has successfully completed

Computer Vision - Object Detection with OpenCV and Python

an online non-credit course authorized by Coursera Project Network and offered through
Coursera

Ilias Papachristos

Ilias Papachristos
Data Analyst - Scientist

COURSE CERTIFICATE



Verify at coursera.org/verify/J2F24RXR5T3V
Coursera has confirmed the identity of this individual and
their participation in the course.



11 Sep, 2020

Akash Singh

has successfully completed

Computer Vision - Object Tracking with OpenCV and Python

an online non-credit course authorized by Coursera Project Network and offered through
Coursera

Ilias Papachristos

Ilias Papachristos
Data Analyst - Scientist

COURSE CERTIFICATE



Verify at coursera.org/verify/DEB9NMBTMSX9
Coursera has confirmed the identity of this individual and
their participation in the course.



08/27/2020

Akash Singh

has successfully completed

Mathematics for Machine Learning: Linear Algebra

an online non-credit course authorized by Imperial College London and offered through Coursera

Two handwritten signatures in black ink. The first signature on the left appears to read "David Dye". The second signature on the right appears to read "Samuel J. Cooper".

David Dye and Samuel J. Cooper

COURSE CERTIFICATE



Verify at coursera.org/verify/7Y8QAJECMVCT

Coursera has confirmed the identity of this individual and their participation in the course.



08/27/2020

Akash Singh

has successfully completed

Mathematics for Machine Learning: Multivariate Calculus

an online non-credit course authorized by Imperial College London and offered through Coursera

Two handwritten signatures in black ink. The first signature on the left appears to read "David Dye". The second signature on the right appears to read "Samuel J. Cooper".

David Dye and Samuel J. Cooper

COURSE CERTIFICATE



Verify at coursera.org/verify/W6QYTWTJ25Z9

Coursera has confirmed the identity of this individual and their participation in the course.



08/27/2020

Akash Singh

has successfully completed

Mathematics for Machine Learning: PCA

an online non-credit course authorized by Imperial College London and offered through Coursera

A handwritten signature in blue ink that reads "Marc Deisenroth".

Marc Deisenroth
Lecturer in Statistical Machine Learning
Department of Computing
Imperial College London

COURSE CERTIFICATE



Verify at coursera.org/verify/UY39UXXFWBEC

Coursera has confirmed the identity of this individual and their participation in the course.



3 Courses

Mathematics for Machine Learning: Linear Algebra
Mathematics for Machine Learning: Multivariate Calculus
Mathematics for Machine Learning: PCA

Imperial College London

08/27/2020

Akash Singh

has successfully completed the online, non-credit Specialization

Mathematics for Machine Learning

A sequence of 3 courses on the prerequisite mathematics for applications in data science and machine learning. Successful participants learn how to represent data in a linear algebra context and manipulate these objects mathematically. They are able to summarise properties of data sets and map them onto lower dimensional spaces with principal component analysis. Finally they can solve optimisation problems and use this skill to train models for describing data such as simple neural networks.

Three handwritten signatures are visible in the background. From left to right, they are: "Samuel J. Cooper", "David Dye", and "Marc Deisenroth".

David Dye
Professor of Metallurgy
Department of Materials
Imperial College London

Samuel J. Cooper
Lecturer
Dyson School of Design
Engineering
Imperial College London

Marc Deisenroth
Senior Lecturer
Department of
Computing
Imperial College London

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Verify this certificate at:
coursera.org/verify/specialization/XDC7LMJ6D3MS



09/05/2020

Akash Singh

has successfully completed

Introduction to HTML5

an online non-credit course authorized by University of Michigan and offered through Coursera

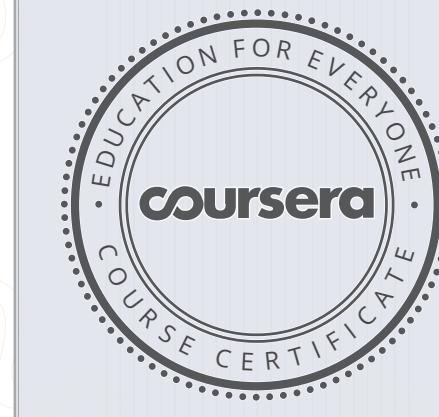
Colleen van Lent

Colleen van Lent, Ph.D.
Lecturer
School of Information, University of Michigan

Charles Severance

Charles Severance
Clinical Professor, School of Information
University of Michigan

COURSE CERTIFICATE



Verify at coursera.org/verify/PXF8SZQP9N9E

Coursera has confirmed the identity of this individual and
their participation in the course.



09/06/2020

Akash Singh

has successfully completed

Introduction to CSS3

an online non-credit course authorized by University of Michigan and offered through Coursera

Colleen van Lent

Colleen van Lent, Ph.D.
Lecturer
School of Information, University of Michigan

Charles

Charles Severance
Clinical Professor, School of Information
University of Michigan

COURSE CERTIFICATE



Verify at coursera.org/verify/A2DSJ6CBLYSY

Coursera has confirmed the identity of this individual and
their participation in the course.



09/06/2020

Akash Singh

has successfully completed

Interactivity with JavaScript

an online non-credit course authorized by University of Michigan and offered through Coursera

Colleen van Lent

Colleen van Lent, Ph.D.
Lecturer
School of Information, University of Michigan

Charles

Charles Severance
Clinical Professor, School of Information
University of Michigan

COURSE CERTIFICATE



Verify at coursera.org/verify/ZC7X5KK9FM8W
Coursera has confirmed the identity of this individual and
their participation in the course.



09/06/2020

Akash Singh

has successfully completed

Advanced Styling with Responsive Design

an online non-credit course authorized by University of Michigan and offered through Coursera

Colleen van Lent

Colleen van Lent, Ph.D.
Lecturer
School of Information, University of Michigan

Charles

Charles Severance
Clinical Professor, School of Information
University of Michigan

COURSE CERTIFICATE



Verify at coursera.org/verify/TEEJNPA82FUT

Coursera has confirmed the identity of this individual and their participation in the course.



09/06/2020

Akash Singh

has successfully completed

Web Design for Everybody Capstone

an online non-credit course authorized by University of Michigan and offered through Coursera

Colleen van Lent

Colleen van Lent, Ph.D.
Lecturer
School of Information, University of Michigan

Charles

Charles Severance
Clinical Professor, School of Information
University of Michigan

COURSE CERTIFICATE



Verify at coursera.org/verify/JFRCHE3JUJZ2

Coursera has confirmed the identity of this individual and their participation in the course.



5 Courses

Introduction to HTML5
Introduction to CSS3
Interactivity with JavaScript
Advanced Styling with Responsive Design
Web Design for Everybody Capstone



09/06/2020

Akash Singh

has successfully completed the online, non-credit Specialization

Web Design for Everybody: Basics of Web Development & Coding

This Specialization covers how to write syntactically correct HTML5 and CSS3, and how to create interactive web experiences with JavaScript. Mastering this range of technologies will allow you to develop high quality web sites that work seamlessly on mobile, tablet, and large screen browsers accessible. During the capstone you will develop a professional-quality web portfolio demonstrating your growth as a web developer and your knowledge of accessible web design. This will include your ability to design and implement a responsive site that utilizes tools to create a site that is accessible to a wide audience, including those with visual, audial, physical, and cognitive impairments.

Colleen van Lent

Colleen van Lent, Ph.D.
Lecturer
School of Information,
University of Michigan

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.

Verify this certificate at:
coursera.org/verify/specialization/6LXKVVXCEZN5



13 Sep, 2020

Akash Singh

has successfully completed

Introduction to Data Science in Python

an online non-credit course authorized by University of Michigan and offered through Coursera

A handwritten signature in black ink that appears to read "Christopher Brooks".

Christopher Brooks
Research Assistant Professor
School of Information

COURSE CERTIFICATE



Verify at coursera.org/verify/98GWKCR3TS4X
Coursera has confirmed the identity of this individual and
their participation in the course.



19.09.2020

Akash Singh

has successfully completed

Applied Plotting, Charting & Data Representation in Python

an online non-credit course authorized by University of Michigan and offered through
Coursera

A handwritten signature in black ink that appears to read "Christopher Brooks".

Christopher Brooks
Research Assistant Professor
School of Information

COURSE CERTIFICATE



Verify at coursera.org/verify/J3MGQJ4JKSNT

Coursera has confirmed the identity of this individual and
their participation in the course.



14 Sep, 2020

Akash Singh

has successfully completed

Applied Machine Learning in Python

an online non-credit course authorized by University of Michigan and offered through Coursera

A handwritten signature in black ink that reads "Kevyn Collins-Thompson".

Kevyn Collins-Thompson
Associate Professor
School of Information

COURSE CERTIFICATE



Verify at coursera.org/verify/RE9SDH2BP9WC
Coursera has confirmed the identity of this individual and
their participation in the course.



16 Sep, 2020

Akash Singh

has successfully completed

Applied Text Mining in Python

an online non-credit course authorized by University of Michigan and offered through Coursera

A handwritten signature in black ink that reads "V.G. Vinod Vydiswaran".

V.G. Vinod Vydiswaran
Assistant Professor
School of Information

COURSE CERTIFICATE



Verify at coursera.org/verify/HVYCJ6HZUTF

Coursera has confirmed the identity of this individual and their participation in the course.



16 Sep, 2020

Akash Singh

has successfully completed

Applied Social Network Analysis in Python

an online non-credit course authorized by University of Michigan and offered through Coursera

A handwritten signature in black ink, appearing to read "Daniel Romero, Ph.D.", placed over a dotted line.

Daniel Romero, Ph.D.
Assistant Professor
School of Information
University of Michigan

COURSE CERTIFICATE



Verify at coursera.org/verify/QDQL64GS67FA

Coursera has confirmed the identity of this individual and their participation in the course.



5 Courses



19.09.2020

Akash Singh

has successfully completed the online, non-credit Specialization

Applied Data Science with Python

The 5 courses in this University of Michigan specialization introduce learners to data science through the python programming language. This skills-based specialization is intended for learners who have a basic python or programming background, and want to apply statistical, machine learning, information visualization, and text analysis techniques to gain new insight into their data. In the final course, students will work on real-world data analysis projects, building a portfolio which showcases their work while at the same time helping real clients gain a better understanding of their data.

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A handwritten signature in black ink.

Christopher Brooks
Research Assistant
Professor
School of Information

A handwritten signature in black ink.

Kevyn Collins-Thompson
Associate Professor
School of Information

A handwritten signature in black ink.

Daniel Romero, Ph.D.
Assistant Professor
School of Information
University of Michigan

A handwritten signature in black ink.

V. G. Vinod Vydiswaran
Assistant Professor
School of Information

Verify this certificate at:
coursera.org/verify/specialization/CDHTSAH9DL4R



28.09.2020

Akash Singh

has successfully completed

Understanding and Visualizing Data with Python

an online non-credit course authorized by University of Michigan and offered through Coursera

Brenda Gunderson
Kerby Shedden
Brady West

Brenda Gunderson, Ph.D., Lecturer IV

Kerby Shedden, Ph.D., Professor

Brady T. West, Ph.D., Research Associate Professor

COURSE CERTIFICATE



Verify at coursera.org/verify/NZAP8BJ96RXW

Coursera has confirmed the identity of this individual and their participation in the course.



26.09.2020

Akash Singh

has successfully completed

Inferential Statistical Analysis with Python

an online non-credit course authorized by University of Michigan and offered through Coursera

*Brenda Gunderson
Kerby Shedden
Brady West*

Brenda Gunderson, Ph.D., Lecturer IV

Kerby Shedden, Ph.D., Professor

Brady T. West, Ph.D., Research Associate Professor

COURSE CERTIFICATE



Verify at coursera.org/verify/RQ2CUCNPCQU6

Coursera has confirmed the identity of this individual and their participation in the course.



27.09.2020

Akash Singh

has successfully completed

Fitting Statistical Models to Data with Python

an online non-credit course authorized by University of Michigan and offered through Coursera

*Brenda Gunderson
Kerby Shedden
Brady West*

Brenda Gunderson, Ph.D., Lecturer IV

Kerby Shedden, Ph.D., Professor

Brady T. West, Ph.D., Research Associate Professor

COURSE CERTIFICATE



Verify at coursera.org/verify/AVVVEG8LLQ8S

Coursera has confirmed the identity of this individual and their participation in the course.



3 Courses

Understanding and Visualizing
Data with Python

Inferential Statistical Analysis
with Python

Fitting Statistical Models to
Data with Python

28.09.2020

Akash Singh

has successfully completed the online, non-credit Specialization

Statistics with Python

This specialization is designed to teach learners beginning and intermediate concepts of statistical analysis, and use of the Python programming language to conduct data analyses. Learners will learn where data come from, what types of data can be collected, how to effectively summarize and visualize data, how to utilize data for estimation and assessing theories, proper interpretations of inferential results, and how to apply more advanced statistical modeling procedures.

Brenda Gunderson
Kerby Sheden
Brady T. West

Brenda Gunderson,
Ph.D., Lecturer IV

Kerby Sheden, Ph.D.,
Professor

Brady T. West, Ph.D.,
Research Associate
Professor

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Verify this certificate at:
coursera.org/verify/specialization/ZZAH9HLFxEW6



University of
California, Irvine

09/09/2020

Akash Singh

has successfully completed

Introduction to the Internet of Things and
Embedded Systems

an online non-credit course authorized by University of California, Irvine and offered
through Coursera

A handwritten signature in black ink that reads "Ian Harris".

Ian Harris
Professor
Department of Computer Science

COURSE
CERTIFICATE



Verify at coursera.org/verify/VDX8CEHFZMV5

Coursera has confirmed the identity of this individual and
their participation in the course.



09/10/2020

Akash Singh

has successfully completed

The Arduino Platform and C Programming

an online non-credit course authorized by University of California, Irvine and offered through Coursera

Ian Harris
Professor
Department of Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/CL972RE9GPKB

Coursera has confirmed the identity of this individual and their participation in the course.



University of
California, Irvine

09/10/2020

Akash Singh

has successfully completed

Interfacing with the Arduino

an online non-credit course authorized by University of California, Irvine and offered
through Coursera

A handwritten signature in black ink that reads "Ian Harris".

Ian Harris
Professor
Department of Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/CX5U5R6YSZCM

Coursera has confirmed the identity of this individual and
their participation in the course.



University of
California, Irvine

09/10/2020

Akash Singh

has successfully completed

The Raspberry Pi Platform and Python
Programming for the Raspberry Pi

an online non-credit course authorized by University of California, Irvine and offered
through Coursera

A handwritten signature in black ink that reads "Ian Harris".

Ian Harris
Professor
Department of Computer Science

COURSE
CERTIFICATE



Verify at coursera.org/verify/6ELJSQKCF9ZR

Coursera has confirmed the identity of this individual and
their participation in the course.



University of
California, Irvine

11 Sep, 2020

Akash Singh

has successfully completed

Interfacing with the Raspberry Pi

an online non-credit course authorized by University of California, Irvine and offered through Coursera



Ian Harris
Professor
Department of Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/3HB2BEZS5DCB
Coursera has confirmed the identity of this individual and
their participation in the course.



University of
California, Irvine

10 Sep, 2020

Akash Singh

has successfully completed

Programming for the Internet of Things Project

an online non-credit course authorized by University of California, Irvine and offered through Coursera

Ian Harris
Professor
Department of Computer Science

COURSE CERTIFICATE



Verify at coursera.org/verify/4APENKJMAPP4
Coursera has confirmed the identity of this individual and
their participation in the course.



6 Courses

Introduction to the Internet of Things and Embedded Systems

The Arduino Platform and C Programming

Interfacing with the Arduino

The Raspberry Pi Platform and Python Programming for the Raspberry Pi

Interfacing with the Raspberry Pi

Programming for the Internet of Things Project



11 Sep, 2020

Akash Singh

has successfully completed the online, non-credit Specialization

An Introduction to Programming the Internet of Things (IOT)

Design, create, and deploy a fun IoT device using Arduino and Raspberry Pi platforms. In this Specialization covers embedded systems, the Raspberry Pi Platform, and the Arduino environment for building devices that can control the physical world. In the final Capstone Project, you'll apply the skills you learned by designing, building, and testing a microcontroller-based embedded system, producing a unique final project suitable for showcasing to future employers.

A handwritten signature in black ink that reads "Ian Harris".

Ian Harris
Professor
Department of
Computer Science

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Verify this certificate at:
coursera.org/verify/specialization/66VS33TYNU8U



Open Source Software Development, Linux and Git Specialization

ISSUED TO

Akash Singh



Issued on: 02 NOV 2020

Issued by: Coursera | Authorized by: The Linux Foundation

Verify: <https://www.youracclaim.com/go/3OAz5VuA>



11 Sep, 2020

Akash Singh

has successfully completed

Open Source Software Development Methods

an online non-credit course authorized by The Linux Foundation and offered through Coursera

A handwritten signature in black ink, appearing to read "Jerry Cooperstein".

Jerry Cooperstein
Director of Training
Training & Certification

COURSE CERTIFICATE



Verify at coursera.org/verify/73V3AP7CZSSR

Coursera has confirmed the identity of this individual and their participation in the course.



11 Sep, 2020

Akash Singh

has successfully completed

Linux for Developers

an online non-credit course authorized by The Linux Foundation and offered through Coursera

A handwritten signature in black ink, appearing to read "Jerry Cooperstein".

Jerry Cooperstein
Director of Training
Training & Certification

COURSE CERTIFICATE



Verify at coursera.org/verify/ZAVB3HYK9KPY
Coursera has confirmed the identity of this individual and
their participation in the course.



11 Sep, 2020

Akash Singh

has successfully completed

Linux Tools for Developers

an online non-credit course authorized by The Linux Foundation and offered through Coursera

A handwritten signature in black ink, appearing to read "Jerry Cooperstein".

Jerry Cooperstein
Director of Training
Training & Certification

COURSE CERTIFICATE



Verify at coursera.org/verify/QXXCXUN8K8S4
Coursera has confirmed the identity of this individual and
their participation in the course.



12 Sep, 2020

Akash Singh

has successfully completed

Using Git for Distributed Development

an online non-credit course authorized by The Linux Foundation and offered through Coursera

A handwritten signature in black ink, appearing to read "Jerry Cooperstein".

Jerry Cooperstein
Director of Training
Training & Certification

COURSE CERTIFICATE



Verify at coursera.org/verify/P347J44LRHM9

Coursera has confirmed the identity of this individual and their participation in the course.



4 Courses

Open Source Software
Development Methods

Linux for Developers

Linux Tools for Developers

Using Git for Distributed
Development

12 Sep, 2020

Akash Singh

has successfully completed the online, non-credit Specialization

Open Source Software Development, Linux and Git

This certifies that the holder of this "Open Source Software Development, Linux and Git" Specialization can work comfortably and productively in open source development communities; has a good understanding of the Linux environment, as well as methods and tools required to successfully use it; and can effectively use Git, the distributed version control system.

The online specialization named in this certificate may draw on material from courses taught on-campus, but the included courses are not equivalent to on-campus courses. Participation in this online specialization does not constitute enrollment at this university. This certificate does not confer a University grade, course credit or degree, and it does not verify the identity of the learner.



A handwritten signature in black ink.

Jerry Cooperstein
Direction of Training
The Linux Foundation

Verify this certificate at:
coursera.org/verify/specialization/KB5C796RE85P



May 16, 2021

Akash Singh

has successfully completed

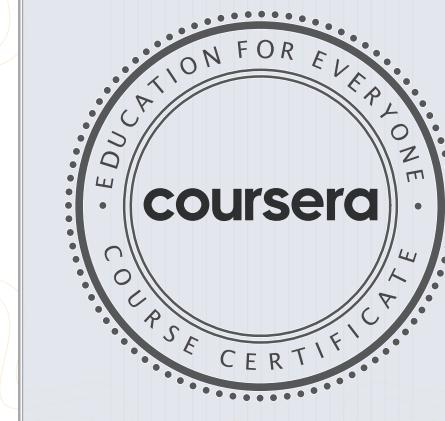
Version Control with Git

an online non-credit course authorized by Atlassian and offered through Coursera

A handwritten signature in black ink that appears to read "Steve Byrnes".

Steve Byrnes
Technical Instructional Designer
Atlassian

COURSE CERTIFICATE



Verify at coursera.org/verify/6GK89MFG8Y95

Coursera has confirmed the identity of this individual and their participation in the course.



UNIVERSITY
OF LONDON

Nov 3, 2020

Akash Singh

has successfully completed

Introduction to Virtual Reality

an online non-credit course authorized by University of London, Goldsmiths, University of London and offered through Coursera

Dr Sylvia Xueni Pan
Lecturer, Department of Computing
Goldsmiths, University of London

Dr Marco Gillies
Computing Department,
Goldsmiths, University of London

COURSE CERTIFICATE



Verify at coursera.org/verify/C5DZXUWYTKLK

Coursera has confirmed the identity of this individual and their participation in the course.



UNIVERSITY
OF LONDON

Nov 7, 2020

Akash Singh

has successfully completed

3D Models for Virtual Reality

an online non-credit course authorized by University of London, Goldsmiths, University of London and offered through Coursera

Dr Sylvia Xueni Pan
Lecturer, Department of Computing
Goldsmiths, University of London

COURSE CERTIFICATE



Verify at coursera.org/verify/SBTM8WFD6UMA

Coursera has confirmed the identity of this individual and their participation in the course.



UNIVERSITY
OF LONDON

Nov 21, 2020

Akash Singh

has successfully completed

3D Interaction Design in Virtual Reality

an online non-credit course authorized by University of London, Goldsmiths, University of London and offered through Coursera

Dr Sylvia Xueni Pan
Lecturer, Department of Computing
Goldsmiths, University of London

COURSE CERTIFICATE



Verify at coursera.org/verify/CAMLCMWKBR2H

Coursera has confirmed the identity of this individual and their participation in the course.



UNIVERSITY
OF LONDON

Nov 21, 2020

Akash Singh

has successfully completed

Building Interactive 3D Characters and Social VR

an online non-credit course authorized by University of London, Goldsmiths, University of London and offered through Coursera

Dr Sylvia Xueni Pan
Lecturer, Department of Computing
Goldsmiths, University of London

Dr Marco Gillies
Computing Department,
Goldsmiths, University of London

COURSE CERTIFICATE



Verify at coursera.org/verify/LCAANYM9Y8B5

Coursera has confirmed the identity of this individual and their participation in the course.



UNIVERSITY
OF LONDON

Nov 30, 2020

Akash Singh

has successfully completed

Making Your First Virtual Reality Game

an online non-credit course authorized by University of London, Goldsmiths, University of London and offered through Coursera

Dr Sylvia Xueni Pan
Lecturer, Department of Computing
Goldsmiths, University of London

Dr Marco Gillies
Computing Department,
Goldsmiths, University of London

COURSE CERTIFICATE



Verify at coursera.org/verify/ZUGE2289LGGQ

Coursera has confirmed the identity of this individual and their participation in the course.



5 Courses

Introduction to Virtual Reality

3D Models for Virtual Reality

3D Interaction Design in Virtual Reality

Building Interactive 3D Characters and Social VR

Making Your First Virtual Reality Game



UNIVERSITY
OF LONDON

Nov 30, 2020

Akash Singh

has successfully completed the online, non-credit Specialization

Virtual Reality

This specialisation from the University of London will introduce you to virtual reality. Virtual reality is one of the highest demand skill sets in the jobs market, and this specialisation will give you an introduction to the subject and key skills in the field. You will hear from world-leading lecturers and industry experts, use Unity to develop your own VR environment, and end the specialisation by creating your first VR game.

Two handwritten signatures in black ink. The signature on the left appears to be "Dr Marco Gillies PhD" and the signature on the right appears to be "Dr Sylvia Xueni Pan PhD".

Dr Marco Gillies PhD
Cantab
Dr Sylvia Xueni Pan PhD

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coursera.org/verify/specialization/A8GYD9WLR7LU