

Certificate Course

On

Applied Machine Learning

Faculty Coordinators: Smt. S. Sharmila Banu

Miss S. Jabeen

Duration: 12/03/2021 to 21/03/2021



K.S.R.M. COLLEGE OF ENGINEERING

(UGC - AUTONOMOUS)

Kadapa, Andhra Pradesh, India - 516003

Approved by AICTE, New Delhi & Affiliated to JNTUA, Ananthapuramu.

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Lr./KSRMCE/ (Department of ECE)/2020-21

Date: 06/03/2021

To
The Principal
KSRM College of Engineering
Kadapa, AP.

Sub: KSRMCE - (Department of ECE) – Permission to conduct certification course on Applied Machine Learning – Request – Reg.

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Respected Sir,

With reference to the cited, the Department of ECE is planning to conduct a certification course on Applied Machine Learning for B.Tech IV SEM ECE students from 12.03.2021 to 26.03.2021 in online mode. In this regard, we kindly request you to grant permission to conduct certification course. This is submitted for your kind perusal.

Thanking you sir,

Yours Faithfully,

Coordinators

Smt. S. Sharmila Banu

Miss S. Jabeen

Cc:
To The Director for Information
To All Deans/HODs



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*Forwarded to the
Principal Sir
G.H*

Permitted
V. S. S. Murthy
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KADAPA - 516 003. (A.P.)



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Dated: 06/03/2021

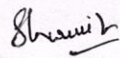
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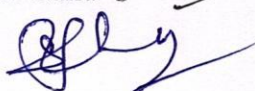
All the B.Tech IV sem ECE students are hereby informed that department of ECE is going to conduct 30 hours certification course on Applied Machine Learning from 12/03/2021 to 26/03/2021. Interested students may register their names with following link on or before 10/03/2021.

Registration Link: <https://forms.gle/C954qihfoJCVTgiZ7>

For any queries contact,

Coordinators

Smt. S. Sharmila Banu 

Miss S. Jabeen 

V. S. S. Murali

Principal

PRINCIPAL

K.S.R.M. COLLEGE OF ENGINEERING
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c to:

The Management /Director / All Deans / All HODS/Staff / Students for information

The IQAC Cell for Documentation



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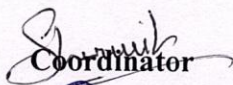
Department of Electronics & Communication Engineering

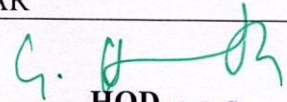
Certificate Course on Applied Machine Learning Registered Student List

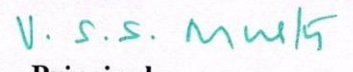
S.No.	Roll Number	Name of the Student	Year & Branch	Email address
1	199Y1A0401	AKULA VENKATESH	Btech IV sem ECE	199Y1A0401@ksrmce.ac.in
2	199Y1A0402	AMBATI MOULEESWARA REDDY	Btech IV sem ECE	199Y1A0402@ksrmce.ac.in
3	199Y1A0403	ANGAJALA KAVYA SREE	Btech IV sem ECE	199Y1A0403@ksrmce.ac.in
4	199Y1A0407	AYYALURI VENKATA PAVAN KUMAR REDDY	Btech IV sem ECE	199Y1A0407@ksrmce.ac.in
5	199Y1A0408	BALASAMUDRAM AJAY KUMAR	Btech IV sem ECE	199Y1A0408@ksrmce.ac.in
6	199Y1A0409	BANDI SAI BALAJI	Btech IV sem ECE	199Y1A0409@ksrmce.ac.in
7	199Y1A0411	BANDISEELA UDAYKUMAR	Btech IV sem ECE	199Y1A0411@ksrmce.ac.in
8	199Y1A0412	BARIVENKULA SREENATH	Btech IV sem ECE	199Y1A0412@ksrmce.ac.in
9	199Y1A0413	BINGIMALLA VENKATA THARUN KUMAR	Btech IV sem ECE	199Y1A0413@ksrmce.ac.in
10	199Y1A0414	BOKKASAM SAI DEEPAK	Btech IV sem ECE	199Y1A0414@ksrmce.ac.in
11	199Y1A0415	BOOSI VENKATA SAINATH REDDY	Btech IV sem ECE	199Y1A0415@ksrmce.ac.in
12	199Y1A0417	C JASHWANTH VARMA	Btech IV sem ECE	199Y1A0417@ksrmce.ac.in
13	199Y1A0418	CHAGANTI TEJESH KUMAR REDDY	Btech IV sem ECE	199Y1A0418@ksrmce.ac.in
14	199Y1A0419	CHALLA STEPHEN KUMAR	Btech IV sem ECE	199Y1A0419@ksrmce.ac.in
15	199Y1A0420	CHAVALI RAJESH	Btech VI sem ECE	199Y1A0420@ksrmce.ac.in
16	199Y1A0421	CHAVVA SAI SUSMITHA	Btech IV sem ECE	199Y1A0421@ksrmce.ac.in
17	199Y1A0422	CHEEPATI VARAPRASAD REDDY	Btech IV sem ECE	199Y1A0422@ksrmce.ac.in
18	199Y1A0423	CHENNABOINA GURU DEEKSHITH	Btech IV sem ECE	199Y1A0423@ksrmce.ac.in
19	199Y1A0424	CHEPPALI ANKAIAH	Btech IV sem ECE	199Y1A0424@ksrmce.ac.in
20	199Y1A0425	CHERUVU SAI PRAKASH	Btech IV sem ECE	199Y1A0425@ksrmce.ac.in

		REDDY		
21	199Y1A0427	CHINNAKOTLA SAI DHEERAJ	Btech IV sem ECE	199Y1A0427@ksrmce.ac.in
22	199Y1A0428	CHINNAULA SANDEEP REDDY	Btech IV sem ECE	199Y1A0428@ksrmce.ac.in
23	199Y1A0430	CHINTAKUNTA VEERA SIVA	Btech IV sem ECE	199Y1A0430@ksrmce.ac.in
24	199Y1A0431	CHINTHALAPALLI MADHURIMA (W)	Btech IV sem ECE	199Y1A0431@ksrmce.ac.in
25	199Y1A0432	DANDE MOUNIKA	Btech IV sem ECE	199Y1A0432@ksrmce.ac.in
26	199Y1A0433	DERANGULA SAI KUMAR	Btech IV sem ECE	199Y1A0433@ksrmce.ac.in
27	199Y1A0436	DEVARASETTY HARIPRIYA	Btech IV sem ECE	199Y1A0436@ksrmce.ac.in
28	199Y1A0437	DINNEPU IIIKAS BHARADWAJ REDDY	Btech IV sem ECE	199Y1A0437@ksrmce.ac.in
29	199Y1A0440	GADDA UPENDRA	Btech IV sem ECE	199Y1A0440@ksrmce.ac.in
30	199Y1A0441	GADDE ANUSHKA	Btech IV sem ECE	199Y1A0441@ksrmce.ac.in
31	199Y1A0442	GAJJALA NAVYA TEJASREE (W)	Btech IV sem ECE	199Y1A0442@ksrmce.ac.in
32	199Y1A0443	GAMPA SIVA KUMAR	Btech IV sem ECE	199Y1A0443@ksrmce.ac.in
33	199Y1A0444	GANDIKOTA SWARNALATHA	Btech IV sem ECE	199Y1A0444@ksrmce.ac.in
34	199Y1A0446	GANGIREDDY SAI PRAVALLIKA	Btech IV sem ECE	199Y1A0446@ksrmce.ac.in
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37	199Y1A0450	GOTLA YESWANTH	Btech IV sem ECE	199Y1A0450@ksrmce.ac.in
38	199Y1A0451	GOURIPEDDI K S SREEDHANYA	Btech IV sem ECE	199Y1A0451@ksrmce.ac.in
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40	199Y1A0456	JANGAMSETTY IINOD	Btech IV sem ECE	199Y1A0456@ksrmce.ac.in
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42	199Y1A0460	KAKARLA SAGAR	Btech IV sem ECE	199Y1A0460@ksrmce.ac.in
43	199Y1A0461	KAKE SAIBHARATH	Btech IV sem ECE	199Y1A0461@ksrmce.ac.in
44	199Y1A0463	KALUVALA SREEIIDYA	Btech IV sem ECE	199Y1A0463@ksrmce.ac.in
45	199Y1A0464	KAMBAM MANOJ KUMAR	Btech IV sem ECE	199Y1A0464@ksrmce.ac.in
46	199Y1A0468	KAYAM IINAY	Btech IV sem ECE	199Y1A0468@ksrmce.ac.in
47	199Y1A0471	KOMPALA SAI CHARAN	Btech IV sem ECE	199Y1A0471@ksrmce.ac.in
48	199Y1A0473	KONDAMUGARI EESHITHA RACHANA	Btech IV sem ECE	199Y1A0473@ksrmce.ac.in

		RAIINDRA		
49	199Y1A0479	KUNDHARAPU VENKATESH	Btech IV sem ECE	199Y1A0479@ksrmce.ac.in
50	199Y1A0483	KURUVA LAKSHMANNA	Btech IV sem ECE	199Y1A0483@ksrmce.ac.in
51	199Y1A0484	KURUVA SAI PRAKASH	Btech IV sem ECE	199Y1A0484@ksrmce.ac.in
52	199Y1A0485	KUTEDDULA JASWANTH REDDY	Btech IV sem ECE	199Y1A0485@ksrmce.ac.in
53	199Y1A0487	M SAI VARDHAN NAIDU	Btech IVsem ECE	199Y1A0487@ksrmce.ac.in
54	199Y1A04E3	SHAIK MOHAMMED GHOUSE	Btech IVsem ECE	199Y1A04E3@ksrmce.ac.in
55	199Y1A04E4	SHAIK MOHAMMED YASEEN	Btech IV sem ECE	199Y1A04E4@ksrmce.ac.in
56	199Y1A04E5	SHAIK MUNAZZAH FATIMA	Btech IV sem ECE	199Y1A04E5@ksrmce.ac.in
57	199Y1A04E6	SHAI MUSAB AHAMED	Btech IV sem ECE	199Y1A04E6@ksrmce.ac.in
58	199Y1A04E7	SHAIK RUMMESA KOUSAR	Btech IV sem ECE	199Y1A04E7@ksrmce.ac.in
59	199Y1A04E8	SHAIK SADAK ALI	Btech IV sem ECE	199Y1A04E8@ksrmce.ac.in
60	199Y1A04E9	SHAIK YUNOOSH HUSSAIN	Btech IV sem ECE	199Y1A04E9@ksrmce.ac.in
61	199Y1A04F0	SIDDAVATAM SUDHARSHAN	Btech IV sem ECE	199Y1A04F0@ksrmce.ac.in
62	199Y1A04F1	SIKILIGIRI SAMEER AHAMMAD	Btech IV sem ECE	199Y1A04F1@ksrmce.ac.in
63	199Y1A04F3	SREERAMADASU VENKATA NAGA SAI	Btech IV sem ECE	199Y1A04F2@ksrmce.ac.in
64	199Y1A04F4	SREERAMULU GARI SANTHOSH	Btech IV sem ECE	199Y1A04F4@ksrmce.ac.in
65	199Y1A04F5	SURA IISHNU VARDHAN REDDY	Btech IV sem ECE	199Y1A04F5@ksrmce.ac.in
66	199Y1A04F6	SURABHI LAKSHMI PRIYA	Btech IV sem ECE	199Y1A04F6@ksrmce.ac.in
67	199Y1A04G3	THOTA SAI AKHILA	Btech IV sem ECE	199Y1A04G3@ksrmce.ac.in
68	199Y1A04G6	TIRUPATHI NAVEEN KUMAR	Btech IV sem ECE	199Y1A04G6@ksrmce.ac.in


Coordinator


HOD
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Department of E.C.E.
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Applied Machine Learning

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Course Objectives:

- Learn the basic fundamentals of Machine Learning.
- Understand Python software and relevant libraries.
- Gain knowledge to verify working of various Machine learning.
- Understand the use case of Machine Learning.

Course Outcomes:

The students will be able to:

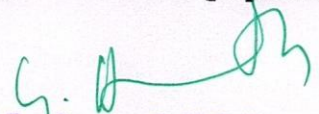
- Understand and implement the most popular learning algorithms
- Perform feature selection and experimental set up on real tasks
- Evaluate multiple learning algorithms across several tasks.

Syllabus:

- Introduction to linear regression (and multivariate linear regression)
- Logistic Regression and regularization
- Practical aspects of implementation
- Decision trees and pruning, implementation of decision trees
- Support vector machines and making them work in practice
- Boosting - implementing different boosting methods with decision trees.
- Using the algorithms for several tasks - how to set up the problem, debug, select features and develop the learning algorithm.
- Unsupervised learning - k-means, PCA, hierarchical clustering.
- Implementing the clustering algorithms
- Parallelizing the learning algorithms
- msApplications
- Choosing from multiple algorithms - What will work?

Text book:

1. <https://www.linkedin.com/learning/excel-data-analysis-forecasting/welcome>
2. A Course in Machine Learning, Hal Daume III (preprint available online)


Professor & H.O.D.
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Department of Electronics & Communication Engineering

Certificate Course on Applied Machine Learning

Schedule

S.No	Date	Time	Faculty	Topic
1	12/03/2021	3 PM to 5PM	Dr. S. Zahiruddin Smt. S. Sharmila Banu Miss S. Jabeen	Introduction to linear regression (and multivariate linear regression).
2	13/03/2021	3PM to 5PM	Dr. S. Zahiruddin	Logistic Regression and regularization.
3	14/03/2021	3 PM to 5PM	Smt. S. Sharmila Banu	Practical aspects of implementation.
4	15/03/2021	3 PM to 5PM	Smt. S. Sharmila Banu	Decision trees and pruning, implementation of decision trees
5	16/03/2021	3 PM to 5PM	Dr. S. Zahiruddin	Support vector machines and making them work in practice
6	17/03/2021	3 PM to 5PM	Dr. S. Zahiruddin	Boosting - implementing different boosting methods with decision trees.
7	18/03/2021	3 PM to 5PM	Dr. S. Zahiruddin	Using the algorithms for several tasks - how to set up the problem, debug, select features and develop the learning algorithm.
8	19/03/2021	3 PM to 5PM	Miss S. Jabeen	Unsupervised learning - k- means, PCA, hierarchical clustering.
9	20/03/2021	3 PM to 5PM	Dr. S. Zahiruddin	Implementing the clustering algorithms
10	21/03/2021	3 PM to 5PM	Dr. S. Zahiruddin	Parallelizing the learning algorithms
11	22/03/2021	3 PM to 5PM	Miss S. Jabeen	MS Applications
12	23/03/2021	3 PM to 5PM	Miss S. Jabeen	Choosing from multiple algorithms - What will work?
13	24/03/2021	3 PM to 5PM	Smt. S. Sharmila Banu,	Decision trees and pruning,

14	25/03/2021	3 PM to 5PM	Miss S. Jabeen Smt. S. Sharmila Banu	implementation of decision trees MS Applications and Advantages.
15	26/03/2021	3 PM to 5PM	Dr. S. Zahiruddin Smt. S. Sharmila Banu Miss S. Jabeen	Certificate distribution

S. Jabeen
Coordinators

[Signature]

G. H. [Signature]
HOD

Professor & H.O.D.
Department of E.C.E.
K.S.R.M. College of Engineering
KADAPA - 516 003.

V. S. S. Mulya
Principal

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ACTIVITY REPORT

Certification Course

On

“Applied Machine Learning”

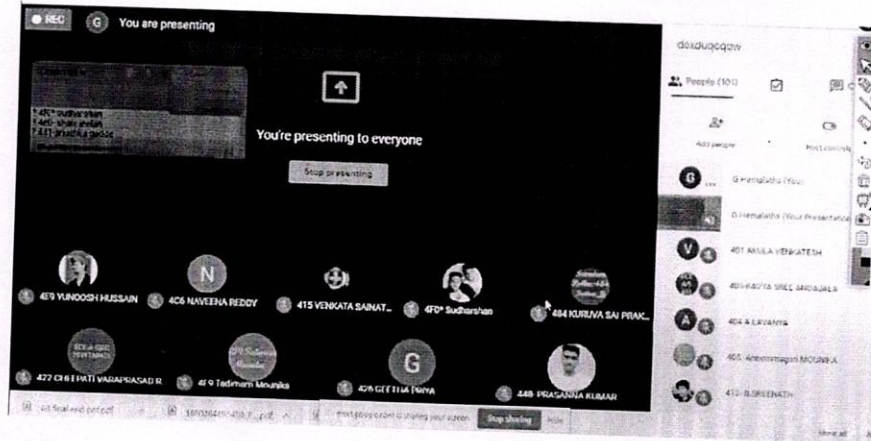
12/03/2021 to 26/03/2021

Target Group	:	Students
Details of Participants	:	68 Students
Coordinators	:	Smt. S. Sharmila Banu, Asst. Prof of ECE Dept Miss S. Jabeen, Asst. Prof of ECE Dept
Organizing Department	:	Department of Electronics & Communication Engineering
Venue	:	In Online Mode

Description:

Certificate course on **“Applied Machine Learning”** was organized by Dept. of ECE from 12th MARCH 2021 to 26th MARCH 2021 in online Mode. Dr. S. Zahiruddin, Smt. S. Sharmila Banu and Miss. S. Jabeen acted as Course instructors. The main aim of the course is to create awareness among students on the fundamental ideas behind Applied Machine Learning. Machine Learning is a great choice for the backend side of development as well as the software development of devices. Some of the many advantages of working with machine learning is the speed at which you can develop code and a large number of libraries for all kinds of platforms. Thirty Hours course was successfully completed and participation certificates were provided to the participants.

Photo :



Smt. S. Sharmila Banu

Miss. S. Jabeen

Coordinators

Handwritten signatures in blue ink. The first signature is for Smt. S. Sharmila Banu, and the second is for Miss. S. Jabeen.

V. S. S. Murali
Principal

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Certificate Course on **APPLIED MACHINE LEARNING**

12/03/2021 TO 26/03/2021

Organized by

**DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING**

44	199Y1A0463	KALUVALA SREEIIDYA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
45	199Y1A0464	KAMBAM MANOJ KUMAR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
46	199Y1A0468	KAYAM IINAY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
47	199Y1A0471	KOMPALA SAI CHARAN	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
48	199Y1A0473	KONDAMUGARI EESHITHA RACHANA RAIINDRA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓
49	199Y1A0479	KUNDHARAPU VENKATESH	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
50	199Y1A0483	KURUVA LAKSHMANNA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
51	199Y1A0484	KURUVA SAI PRAKASH	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
52	199Y1A0485	KUTEDDULA JASWANTH REDDY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
53	199Y1A0487	M SAI VARDHAN NAIDU	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
54	199Y1A04E3	SHAIK MOHAMMED GHOUSE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
55	199Y1A04E4	SHAIK MOHAMMED YASEEN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
56	199Y1A04E5	SHAIK MUNAZZAH FATIMA	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓
57	199Y1A04E6	SHAI MUSAB AHAMED	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
58	199Y1A04E7	SHAIK RUMMESA KOUSAR	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
59	199Y1A04E8	SHAIK SADAK ALI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
60	199Y1A04E9	SHAIK YUNOOSH HUSSAIN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
61	199Y1A04F0	SIDDAVATAM SUDHARSHAN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
62	199Y1A04F1	SIKILIGIRI SAMEER AHAMMAD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
63	199Y1A04F3	SREERAMADASU VENKATA NAGA SAI	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓
64	199Y1A04F4	SREERAMULU GARI SANTHOSH	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
65	199Y1A04F5	SURA IISHNU VARDHAN REDDY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
66	199Y1A04F6	SURABHI LAKSHMI PRIYA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
67	199Y1A04G3	THOTA SAI AKHILA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
68	199Y1A04G6	TIRUPATHI NAVEEN KUMAR	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓	✗

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Coordinator

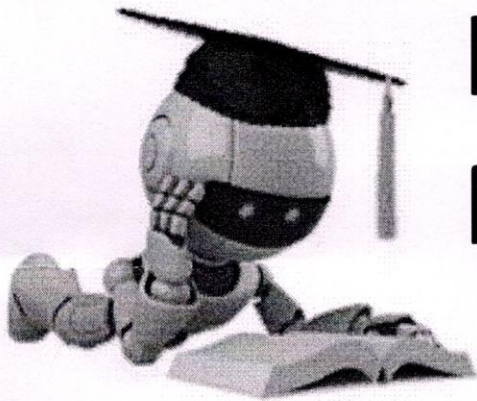
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K.S.R.M. College of Engineering
KADAPA - 516 003.

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Principal
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CIS 419/519

Introduction to Machine Learning

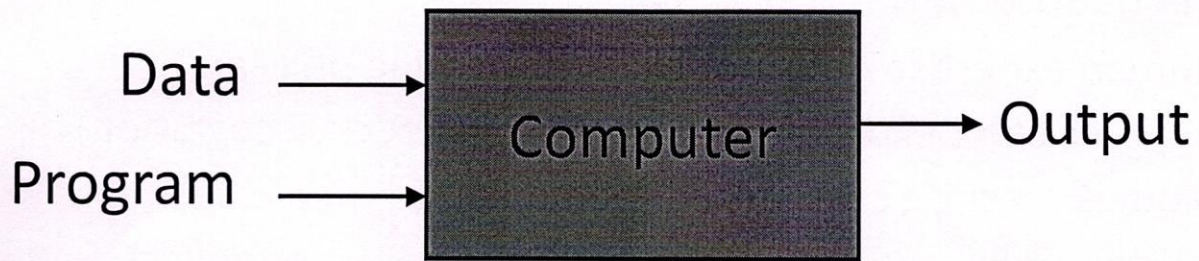


Instructor: Eric Eaton

www.seas.upenn.edu/~cis519

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Traditional Programming



Machine Learning



A classic example of a task that requires machine learning:

It is very hard to say what makes a 2

0 0 0 1 1 1 1 1 2

2 2 2 2 2 2 2 3 3 3

3 4 4 4 4 4 5 5 5 5

6 6 7 7 7 7 8 8 8

9 9 9 9 9 9 9 9 9

Sample Applications

- Web search
- Computational biology
- Finance
- E-commerce
- Space exploration
- Robotics
- Information extraction
- Social networks
- Debugging software
- [Your favorite area]

Defining the Learning Task

Improve on task T, with respect to performance metric P, based on experience E

T: Playing checkers

P: Percentage of games won against an arbitrary opponent

E: Playing practice games against itself

T: Recognizing hand-written words

P: Percentage of words correctly classified

E: Database of human-labeled images of handwritten words

T: Driving on four-lane highways using vision sensors

P: Average distance traveled before a human-judged error

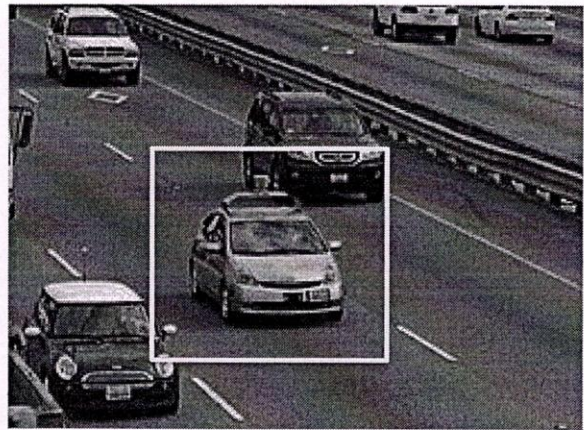
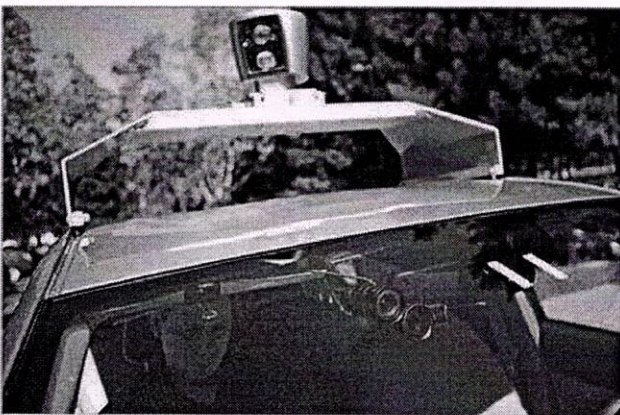
E: A sequence of images and steering commands recorded while observing a human driver.

T: Categorize email messages as spam or legitimate.

P: Percentage of email messages correctly classified.

E: Database of emails, some with human-given labels

Autonomous Cars

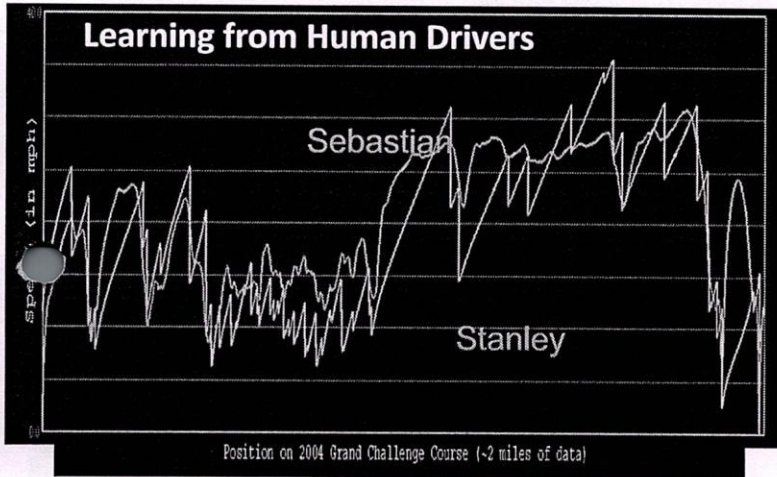
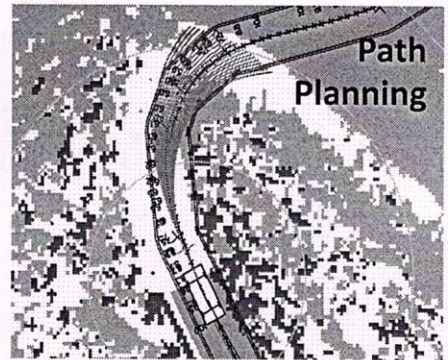


- Nevada made it legal for autonomous cars to drive on roads in June 2011
- As of 2013, four states (Nevada, Florida, California, and Michigan) have legalized autonomous cars

Penn's Autonomous Car →
(Ben Franklin Racing Team)

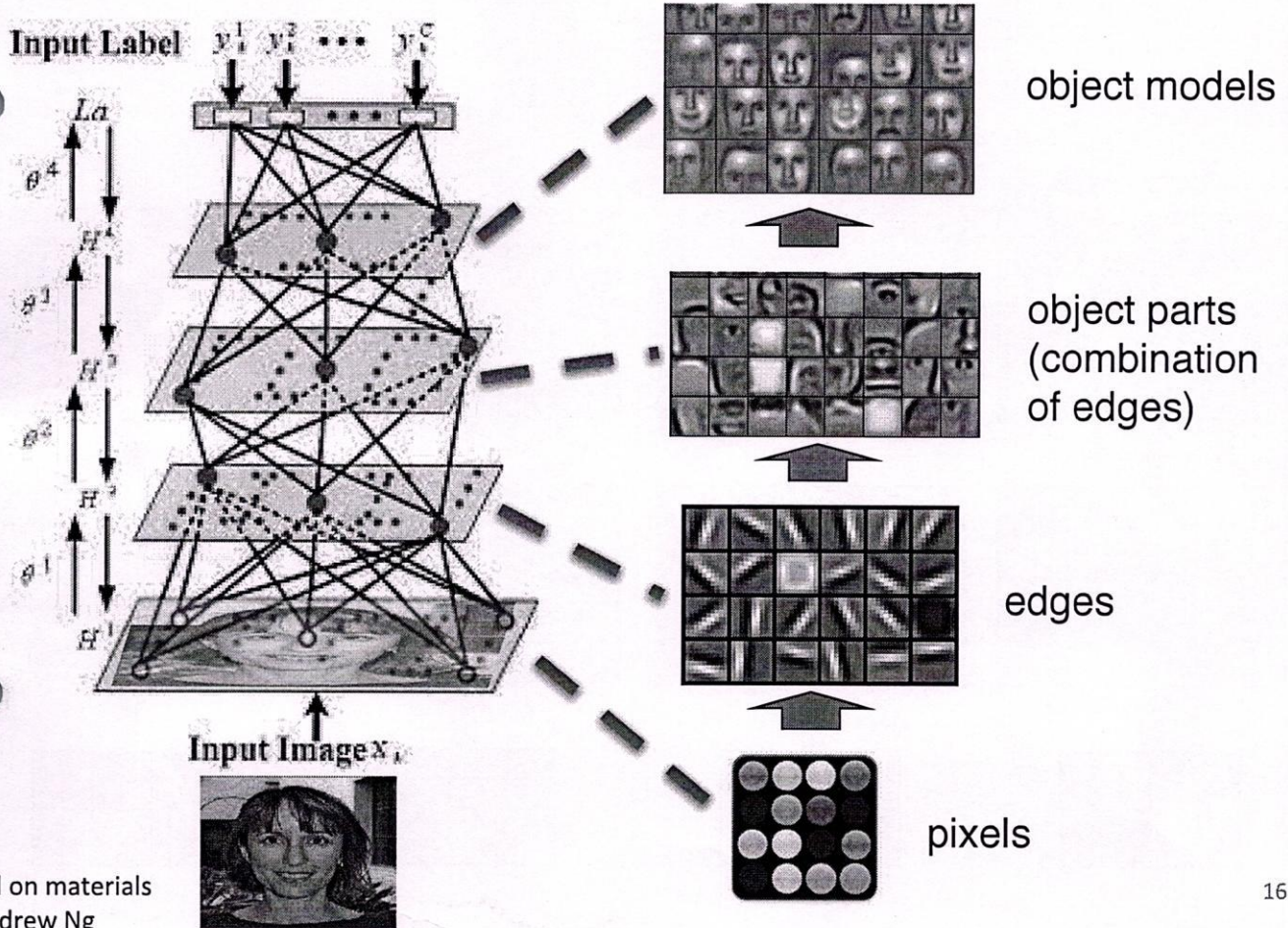


Autonomous Car Technology



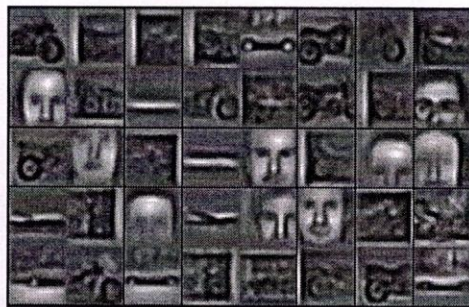
Images and movies taken from Sebastian Thrun's multimedia website.

Deep Belief Net on Face Images

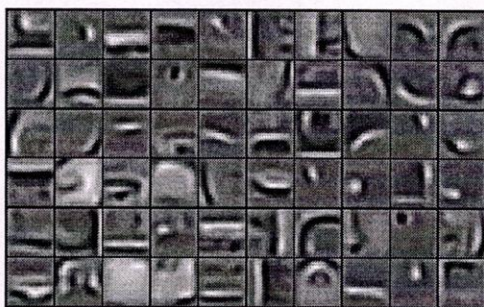


Based on materials
by Andrew Ng

Training on Multiple Objects

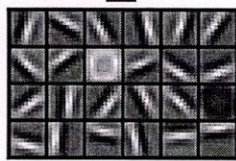


Trained on 4 classes (cars, faces, motorbikes, airplanes).



Second layer: Shared-features and object-specific features.

Third layer: More specific features.



Inference from Deep Learned Models

Generating posterior samples from faces by “filling in” experiments
(cf. Lee and Mumford, 2003). Combine bottom-up and top-down inference.

Input images



Samples from
feedforward
Inference
(control)



Samples from
Full posterior
inference



Impact of Deep Learning in Speech Technology



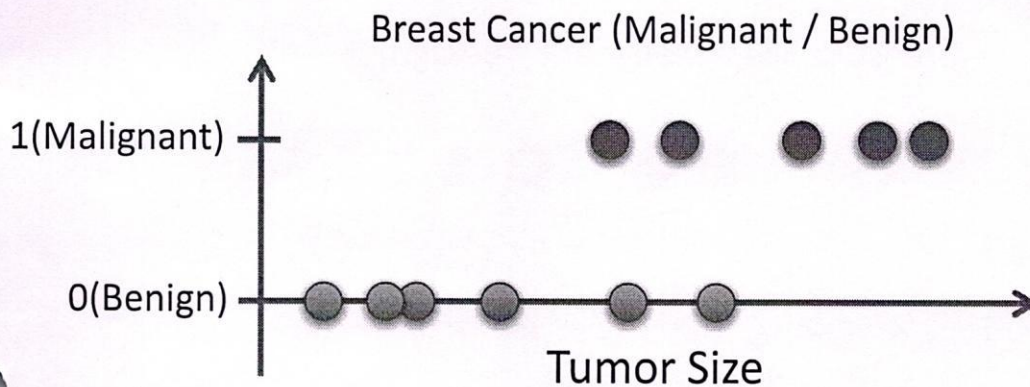
Slide credit: Li Deng, MS Research

Types of Learning

- **Supervised (inductive) learning**
 - Given: training data + desired outputs (labels)
- **Unsupervised learning**
 - Given: training data (without desired outputs)
- **Semi-supervised learning**
 - Given: training data + a few desired outputs
- **Reinforcement learning**
 - Rewards from sequence of actions

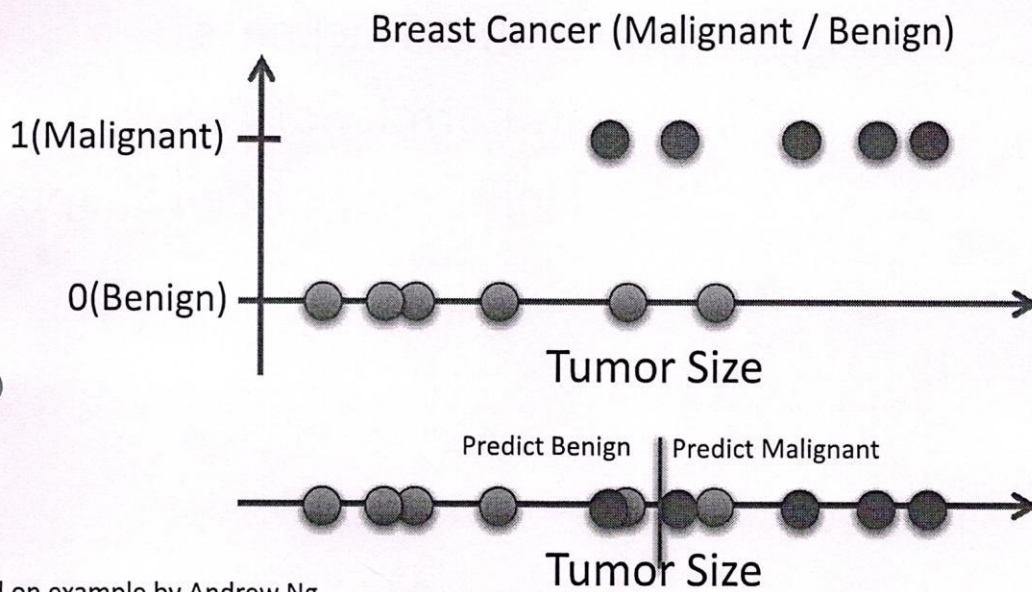
Supervised Learning: Classification

- Given $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$
- Learn a function $f(x)$ to predict y given x
 - y is categorical == classification



Supervised Learning: Classification

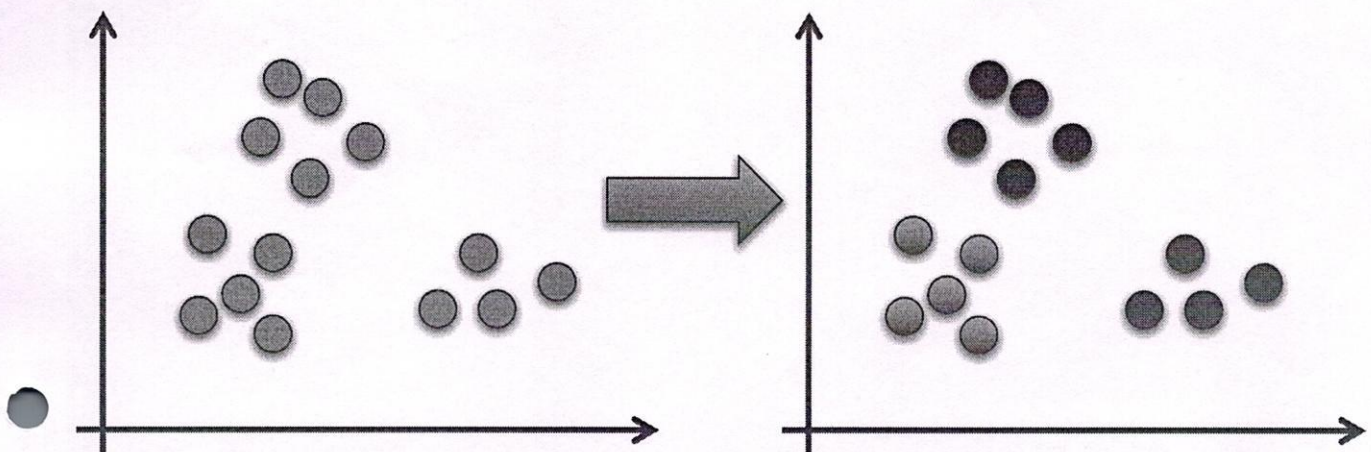
- Given $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$
- Learn a function $f(x)$ to predict y given x
 - y is categorical == classification



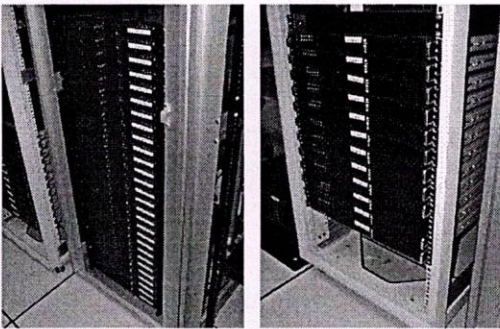
Based on example by Andrew Ng

Unsupervised Learning

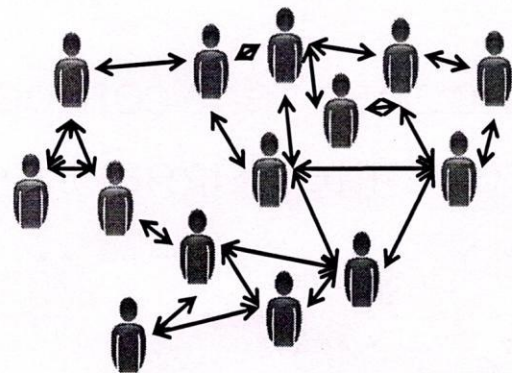
- Given x_1, x_2, \dots, x_n (without labels)
- Output hidden structure behind the x 's
 - E.g., clustering



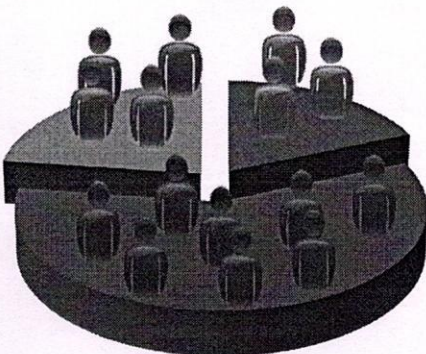
Unsupervised Learning



Organize computing clusters



Social network analysis



Market segmentation

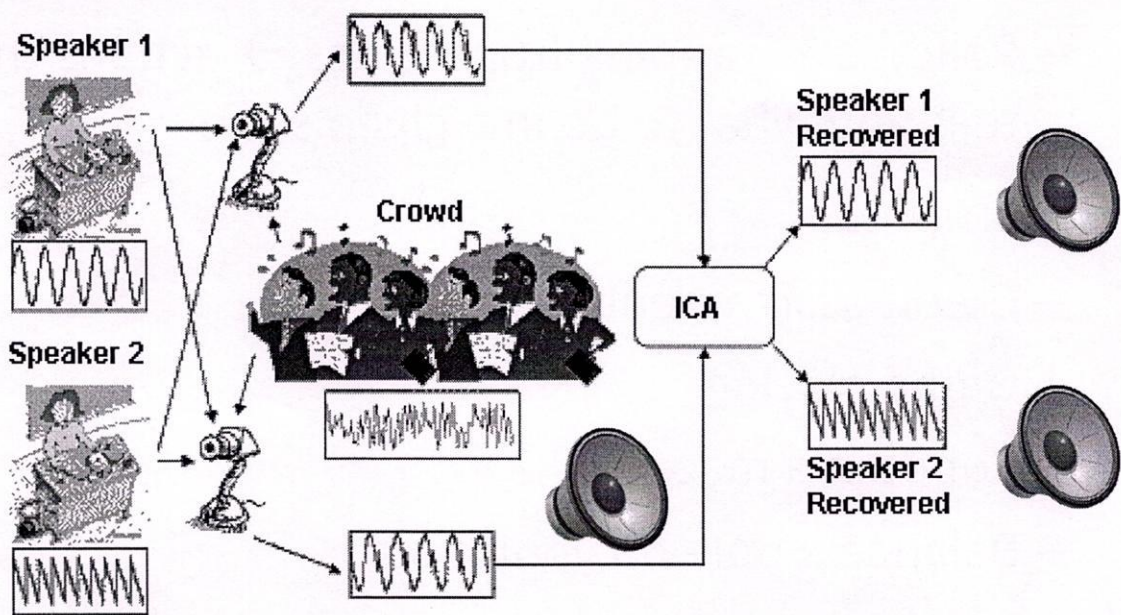


Astronomical data analysis

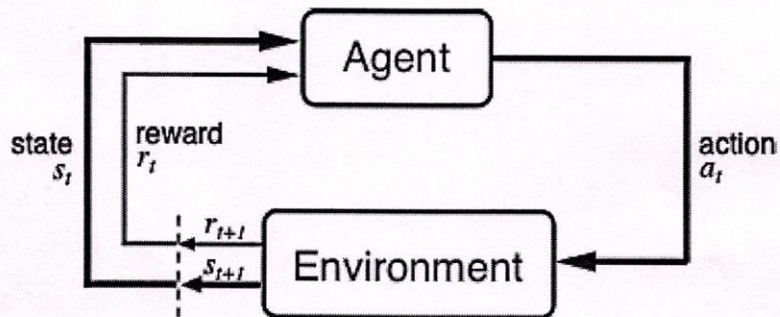
Slide credit: Andrew Ng

Unsupervised Learning

- Independent component analysis – separate a combined signal into its original sources



The Agent-Environment Interface



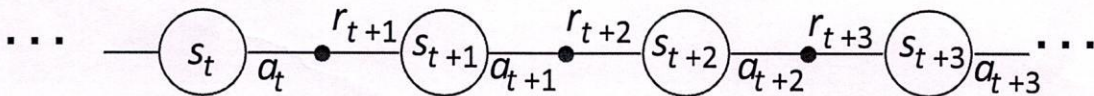
Agent and environment interact at discrete time steps : $t = 0, 1, 2, K$

Agent observes state at step t : $s_t \in \mathcal{S}$

produces action at step t : $a_t \in A(s_t)$

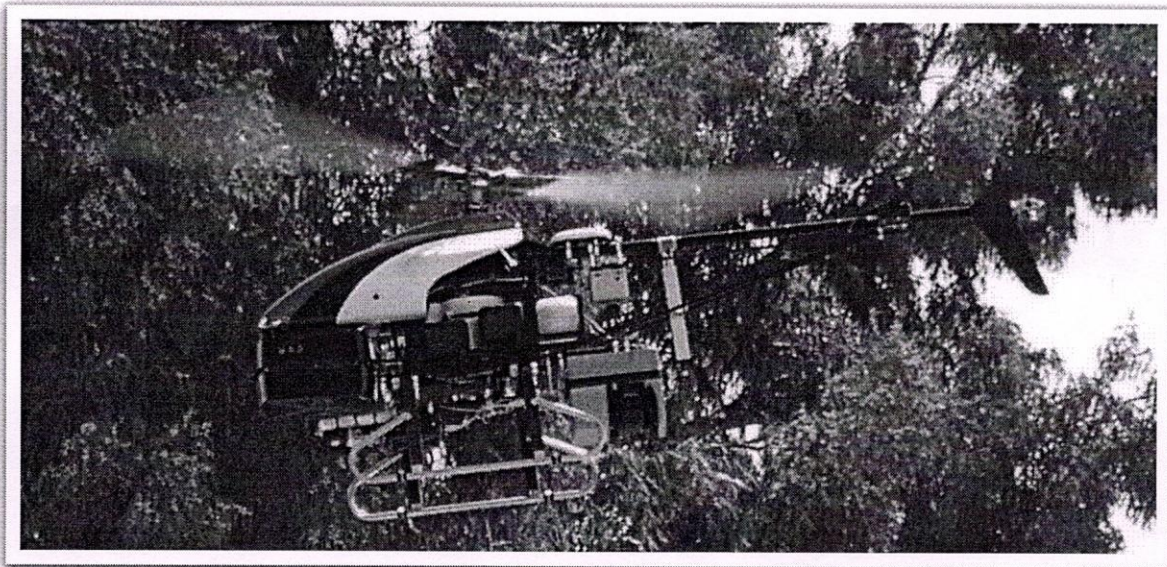
gets resulting reward : $r_{t+1} \in \mathcal{R}$

and resulting next state : s_{t+1}



Inverse Reinforcement Learning

- Learn policy from user demonstrations



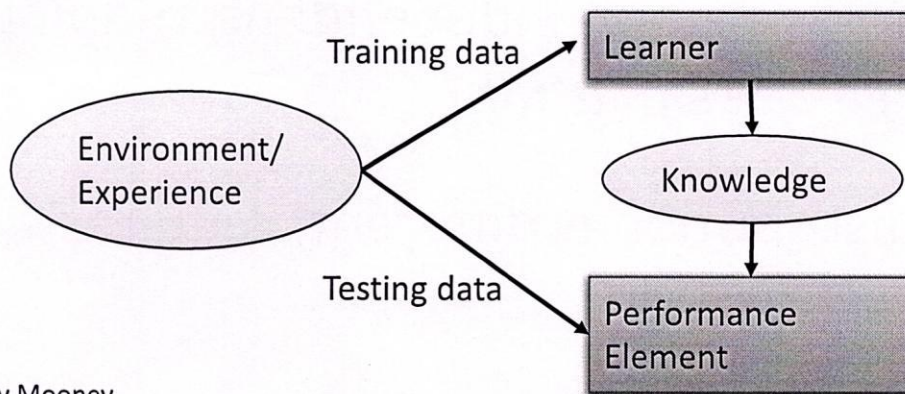
Stanford Autonomous Helicopter

<http://heli.stanford.edu/>

<https://www.youtube.com/watch?v=VCdxqn0fcnE>

Designing a Learning System

- Choose the training experience
- Choose exactly what is to be learned
 - i.e. the *target function*
- Choose how to represent the target function
- Choose a learning algorithm to infer the target function from the experience



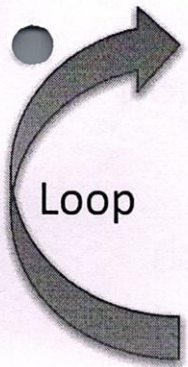
ML in a Nutshell

- Tens of thousands of machine learning algorithms
 - Hundreds new every year
- Every ML algorithm has three components:
 - **Representation**
 - **Optimization**
 - **Evaluation**

Various Search/Optimization Algorithms

- Gradient descent
 - Perceptron
 - Backpropagation
- Dynamic Programming
 - HMM Learning
 - PCFG Learning
- Divide and Conquer
 - Decision tree induction
 - Rule learning
- Evolutionary Computation
 - Genetic Algorithms (GAs)
 - Genetic Programming (GP)
 - Neuro-evolution

ML in Practice



- Understand domain, prior knowledge, and goals
- Data integration, selection, cleaning, pre-processing, etc.
- Learn models
- Interpret results
- Consolidate and deploy discovered knowledge

A Brief History of Machine Learning

History of Machine Learning (cont.)

- 1980s:
 - Advanced decision tree and rule learning
 - Explanation-based Learning (EBL)
 - Learning and planning and problem solving
 - Utility problem
 - Analogy
 - Cognitive architectures
 - Resurgence of neural networks (connectionism, backpropagation)
 - Valiant's PAC Learning Theory
 - Focus on experimental methodology
- 1990s
 - Data mining
 - Adaptive software agents and web applications
 - Text learning
 - Reinforcement learning (RL)
 - Inductive Logic Programming (ILP)
 - Ensembles: Bagging, Boosting, and Stacking
 - Bayes Net learning

What We'll Cover in this Course

- **Supervised learning**
 - Decision tree induction
 - Linear regression
 - Logistic regression
 - Support vector machines & kernel methods
 - Model ensembles
 - Bayesian learning
 - Neural networks & deep learning
 - Learning theory
- **Unsupervised learning**
 - Clustering
 - Dimensionality reduction
- **Reinforcement learning**
 - Temporal difference learning
 - Q learning
- **Evaluation**
- **Applications**

Our focus will be on applying machine learning to real applications

Brought to you by:



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for
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Understand machine learning fundamentals

Make sense of machine learning algorithms

Build your data science team



Judith Hurwitz
Daniel Kirsch

IBM Limited Edition



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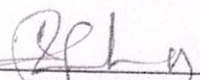
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S.No.	Email address	Name of the student	Year & Semester	Branch	Roll Num	Is the course content met your expectation	Is the lecture sequence well planned	The contents of the course is explained with examples	Is the level of course high	Is the course exposed you to the new knowledge and practices	Is the lecturer clear and easy to understand	Rate the value of course in increasing your skills	Any issues
1	199Y1A0401@ksrmce.ac.in	AKULA VENKATESH	B.tech IV sem	ECE	199Y1A0401	Yes	Yes	Agree	Agree	Strongly agree	4	5	Nothing
2	199Y1A0402@ksrmce.ac.in	AMBATI MOULEESWARA	B.tech IV sem	ECE	199Y1A0402	Yes	Yes	Agree	Agree	Strongly agree	5	5	Nothing
3	199Y1A0403@ksrmce.ac.in	ANGAJALA KAVYA SREE	B.tech IV sem	ECE	199Y1A0403	Yes	Yes	Agree	Agree	Strongly agree	4	5	Good
4	199Y1A0407@ksrmce.ac.in	VENKATA PAVAN KUMAR	B.tech IV sem	ECE	199Y1A0407	Yes	Yes	Agree	Agree	Strongly agree	5	5	nothing
5	199Y1A0408@ksrmce.ac.in	BALASAMUDRAM AJAY KUMAR	B.tech IV sem	ECE	199Y1A0408	Yes	Yes	Agree	Agree	Strongly agree	5	5	Good
6	199Y1A0409@ksrmce.ac.in	BANDI SAI BALAJI	B.tech IV sem	ECE	199Y1A0409	Yes	Yes	Agree	Agree	Strongly agree	4	5	very good
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9	199Y1A0413@ksrmce.ac.in	BINGIMALLA VENKATA THARUN KUMAR	B.tech IV sem	ECE	199Y1A0413	Yes	Yes	Strongly agree	Agree	Strongly agree	5	5	Nothing
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28	199Y1A0437@ksrmce.ac.in	DINNEPU VIKAS BHARADWAJ REDDY	B.tech IV sem	ECE	199Y1A0437	Yes	Yes	agree	Agree	Strongly agree	3	4	no
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42	199Y1A0460@ksrmce.ac.in	KAKARLA SAGAR	B.tech IV sem	ECE	199Y1A0460	Yes	Yes	agree	Agree	Strongly agree	4	5	Good
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53	199Y1A0487@ksrmce.ac.in	M SAI VARDHAN NAIDU	B.tech IV sem	ECE	199Y1A0487	Yes	Yes	agree	Agree	Strongly agree	4	5	nothing
54	199Y1A04E3@ksrmce.ac.in	MOHAMMED GHOUSE	B.tech IV sem	ECE	199Y1A04E3	Yes	Yes	agree	Agree	Strongly agree	4	5	nothing
55	199Y1A04E5@ksrmce.ac.in	SHAIK MOHAMMED YASEEN	B.tech IV sem	ECE	199Y1A04E4	Yes	Yes	agree	Agree	Strongly agree	4	5	nothing
56	199Y1A04E5@ksrmce.ac.in	MUNAZZAH FATIMA	B.tech IV sem	ECE	199Y1A04E5	Yes	Yes	agree	Agree	Strongly agree	4	5	Good
57	199Y1A04E6@ksrmce.ac.in	SHAI MUSAB AHAMED	B.tech IV sem	ECE	199Y1A04E6	Yes	Yes	agree	Agree	Strongly agree	5	5	Good
58	199Y1A04E7@ksrmce.ac.in	SHAIK RUMMESA	B.tech IV sem	ECE	199Y1A04E7	Yes	Yes	agree	Agree	Strongly agree	5	5	very good
59	199Y1A04E8@ksrmce.ac.in	SHAIK SADAK ALI	B.tech IV sem	ECE	199Y1A04E8	Yes	Yes	Strongly agree	Agree	Strongly agree	5	5	very good
60	199Y1A04E9@ksrmce.ac.in	YUNOOSH HUSSAIN	B.tech IV sem	ECE	199Y1A04E9	Yes	Yes	Strongly agree	Agree	Strongly agree	5	5	nothing
61	199Y1A04F0@ksrmce.ac.in	SIDDAVATAM SUDHARSHAN	B.tech IV sem	ECE	199Y1A04F0	Yes	Yes	agree	Agree	Strongly agree	5	5	no
62	199Y1A04F1@ksrmce.ac.in	SIKILIGIRI SAMEER	B.tech IV sem	ECE	199Y1A04F1	Yes	Yes	agree	Agree	Strongly agree	5	5	Nothing
63	199Y1A04F3@ksr	SREERAMADAS U VENKATA NAGA SAI	B.tech IV sem	ECE	199Y1A04F3	Yes	Yes	agree	Agree	Strongly agree	5	5	Nothing

64	199Y1A04F4@ksr	SREERAMULU GARI SANTHOSH	B.tech IV sem	ECE	199Y1A04F4	Yes	Yes	agree	Agree	Strongly agree	5	5	Nothing
65	199Y1A04F5@ksr	SURA IISHNU VARDHAN REDDY	B.tech IV sem	ECE	199Y1A04F5	Yes	Yes	agree	Agree	Strongly agree	5	5	Nothing
66	199Y1A04F6@ksr	SURABHI LAKSHMI PRIYA	B.tech IV sem	ECE	199Y1A04F6	Yes	Yes	agree	Agree	Strongly agree	5	5	Nothing
67	199Y1A04G3@ksr	THOTA SAI AKHILA	B.tech IV sem	ECE	199Y1A04G3	Yes	Yes	agree	Agree	Strongly agree	5	5	Nothing
68	199Y1A04G6@ksr	TIRUPATHI NAVEEN KUMAR	B.tech IV sem	ECE	199Y1A04G6	Yes	Yes	agree	Agree	Strongly agree	5	5	Nothing

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