Probability and Random Process

Lecture 0

Sunil Thomas T

College of Engineering Attingal

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July 6, 2015

Introduction

Who am I?

Hi, I am Sunil Thomas Thonikuzhiyil (Sunil TT), Associate Professor,
I hold a PhD from Department of Electrical Engineering IIT Bombay.

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My Interests

My specialization is in Machine Learning and Pattern Recognition.
I am interested in Free software, Open Hardware, Signal processing and numerous other things. You may look at my web page at `http://brainstorms.in/`
You can also look at my Google scholar page which lists my recent publications.
An older list of my writings are at the Linux gazette magazine website.

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For geeks only

I am a geek by nature and interested in meeting and mentoring upcoming geeks.

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How to contact me

The best way to catch me inside or outside the campus is to drop a mail to suniltt@gmail.com. I will respond to you as early as possible. I don't entertain personal phone calls.

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On Social Media

I maintain an active profile on FB, giving my private views on wide ranging topics like politics, technology and my own life experience. You are welcome to follow me. (No friend requests please). Note that these opinions are private and personal and do not reflect the policy of the college. I might be taking diametrically opposite stance in my official capacity at the college.
https://www.facebook.com/vu2swx/

Course Introduction

Probability and Random Process is a slightly advanced course for second years.
You need to have good mathematical foundations to fully understand the stuff.

There are four modules in the prescribed syllabus.
You may look at the university website for details about evaluation and examination scheme

Administrative trivia

Attendance

As per college policy.
However, I am generally lenient on such trivial matters but college policy will be the rule.

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Electronic Gadgets

No mobile phones, tablets or laptops while the lecture is in progress. (Again college policy rulez) :D

Administrative trivia

Course website

We will be using lot of online resources extensively during the course. I will try to make available all the lectures slides, videos and other material on the course website.
I will post the URL in the next lecture.

Administrative trivia

Lectures

On all Mondays, Wednesdays and Fridays
I might take additional lectures on other days. So be prepared to tolerate me at any time.

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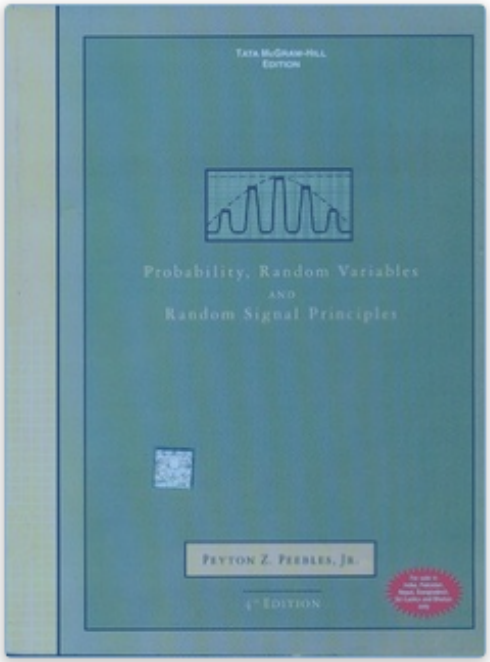
Office hours

Fridays : 1.30 pm to 2 pm.
Additional hours: By appointment.(send me an email)

References



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PROBABILITY, RANDOM VARIABLES, AND RANDOM SIGNAL PRINCIPLES Paperback – 4 Mar 2002

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Read more

Andrey Kolmogorov

From Wikipedia, the free encyclopedia

This name uses Eastern Slavic naming customs; the patronymic is Nikolajewitsch *and the family name is* Kolmogorov.

Andrey Nikolaevich Kolmogorov (Russian: Андрей Николаевич Колмогоров; IPA: [ɐnˈdrʲej nʲɪkəˈlajɪvʲɪtɕ kəlmɐˈgorəf] (listen), 25 April 1903 – 20 October 1987)[3][4] was a 20th-century Soviet mathematician who made significant contributions to the mathematics of probability theory, topology, intuitionistic logic, turbulence, classical mechanics, algorithmic information theory and computational complexity.

Contents [hide]

Andrey Kolmogorov

Born Andrey Nikolaevich Kolmogorov
25 April 1903
Tambov, Russian Empire

Biography [edit]

Early life [edit]

Introduction to Set Theory

What is a set ? A collection of objects.
These objects are called elements of the set.
In this class we will represent sets by capital letters and elements by small letters.
We enumerate elements of a set in curly brackets.$\{..\}$

Notation

$a \in A$
$a \notin A$
Null set is denoted by ϕ
$A \subseteq B$
$A \subset B$

Introduction to Set Theory

Disjoint sets
Mutually exclusive

Introduction to Set Theory

Countable sets
Uncountable sets
Finite sets
Infinite sets

Introduction to Set Theory

Examples

$A = \{1, 2, 3, 4\}$
$B = \{1, 2, 3, \cdots\}$
$C = \{0.5 \leq c \leq 1\}$

Introduction to Set Theory

Examples

$A = \{1, 2, 3, 4\}$
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Examples

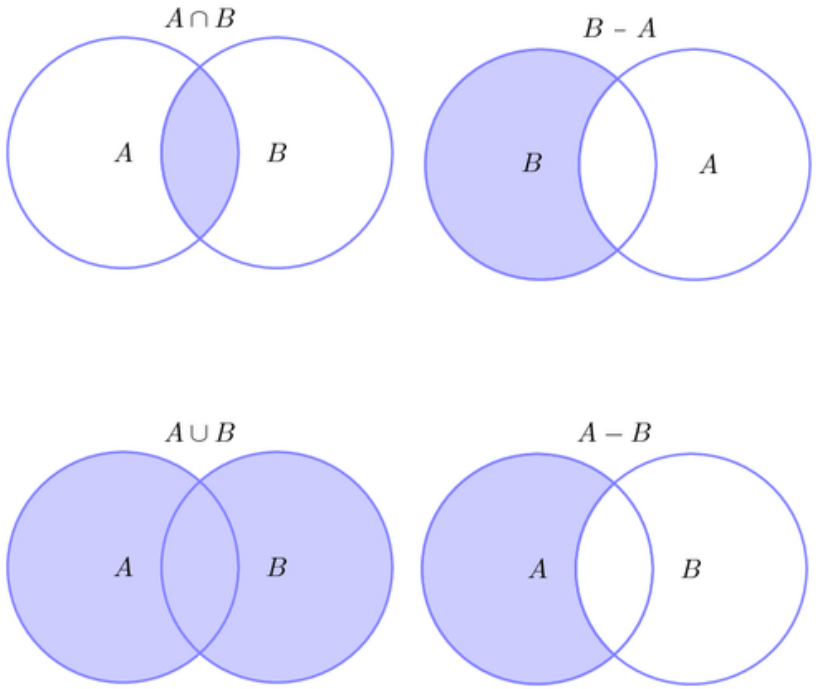
$A = \{1, 2, 3, 4\}$ Countable finite
$B = \{1, 2, 3, \cdots\}$ Countable infinite
$C = \{0.5 \leq c \leq 1\}$ Uncountable infinite

Introduction to Set Theory

Set operations

Equality and difference
Union and Intersection
Compliment

Introduction to Set Theory



Introduction to Set Theory

Algebra of Sets

Commutative Laws

$A \cap B = B \cap A$

$A \cup B = B \cup A$

Distributive Laws

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

$A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

Associative Laws

$(A \cup B) \cup C = A \cup (B \cup C) = A \cup B \cup C$

$(A \cap B) \cap C = A \cap (B \cap C) = A \cap B \cap C$

Introduction to Set Theory

De Morgan's Laws

$\overline{A \cup B} = \bar{A} \cap \bar{B}$

$\overline{A \cap B} = \bar{A} \cup \bar{B}$