

NPTEL Video Lecture Topic List - Created by LinuXpert Systems, Chennai

NPTEL Video Course - Mathematics - NOC:Geometry of Vision

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Co-ordinating Institute - Chennai Mathematical Institute

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

- Lecture 1 - Introduction - Geometry of Vision
- Lecture 2 - Chapter One: The Power of Vanishing Points
- Lecture 3 - Drawing parallel lines: a thought experiment
- Lecture 4 - Why do the images of lines terminate ?
- Lecture 5 - Why do some lines share a vanishing point ?
- Lecture 6 - Why do some lines remain parallel ?
- Lecture 7 - The vanishing point theorem
- Lecture 8 - The horizon line theorem
- Lecture 9 - Three views of a tiled floor
- Lecture 10 - Demo: drawing the third perspective view
- Lecture 11 - The second perspective view revisited
- Lecture 12 - Demo: drawing railway tracks
- Lecture 13 - Three views of a box
- Lecture 14 - Demo: drawing in one point and two point perspective
- Lecture 15 - What does a perspective drawing reveal about the viewer ?
- Lecture 16 - Chapter Two: A Geometry of Coincidence
- Lecture 17 - Incidence relations
- Lecture 18 - Linear spaces
- Lecture 19 - Extending the euclidean plane
- Lecture 20 - The shape of this extended plane
- Lecture 21 - Incidence relations in the extended plane
- Lecture 22 - Coincidence #1 the harmonic conjugate theorem
- Lecture 23 - Proof of the harmonic conjugate theorem
- Lecture 24 - Coincidence #2 Pappus's theorem
- Lecture 25 - Coincidence #3 Desargues's theorem
- Lecture 26 - The extended euclidean space P^3
- Lecture 27 - Desargues's theorem in three dimensions
- Lecture 28 - A Shadow drawing challenge
- Lecture 29 - Solution to the Shadow drawing challenge

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- Lecture 30 - Proving Desargues's in three dimensions
- Lecture 31 - Lifting Desargues's theorem from the plane
- Lecture 32 - How to prove the converse
- Lecture 33 - Chapter Three: The Shadow of a Square
- Lecture 34 - Perspectivities the maps that shift perspective
- Lecture 35 - Visualizing perspectivities
- Lecture 36 - Perspectivities are well defined
- Lecture 37 - The harmonic conjugate theorem revisited
- Lecture 38 - Projectivities sequences of perspectivities
- Lecture 39 - 1D projectivities a puzzle
- Lecture 40 - 1D projectivities a harder puzzle
- Lecture 41 - Projectivities as functions
- Lecture 42 - The three fixed points theorem
- Lecture 43 - 1D fundamental theorem of projective geometry
- Lecture 44 - The criss cross construction
- Lecture 45 - Proving pappus's theorem
- Lecture 46 - 2D Fundamental theorem of projective geometry
- Lecture 47 - The four fixed points lemma
- Lecture 48 - The shadow of a square
- Lecture 49 - Chapter Four: The Analytic Framework
- Lecture 50 - Introducing the cross ratio
- Lecture 51 - Evenly spaced points
- Lecture 52 - How many cross ratios ?
- Lecture 53 - Invariance of the cross ratio
- Lecture 54 - Injectivity of the cross ratio
- Lecture 55 - Proving the 3 fixed points theorem
- Lecture 56 - Bonus: the cross ratio as a function
- Lecture 57 - The real projective plane
- Lecture 58 - Homogeneous coordinates
- Lecture 59 - Homogenous proof that parallel lines converge
- Lecture 60 - Bonus: join and meet as cross product
- Lecture 61 - Affine charts
- Lecture 62 - The matrix group of transformations of RP^2
- Lecture 63 - The fundamental theorem of $PGL(3,R)$
- Lecture 64 - Visualizing the action of $PGL(3,R)$
- Lecture 65 - Proving the fundamental theorem of $PGL(3,R)$
- Lecture 66 - Conclusion to Geometry of Vision