CS231n- Lecture 1

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1 Image Classification

History
  543 Million Years Ago we just had animals floating in water
  Not too many different types of animals
  There is then suddenly a huge explosion in the no. of species in Animals
  Increased Diversity– predatory prey relationships etc. started evolving
  People believe this change occurred because of the coming of "eyes"
  "Eyes" => finding prey to eat. Biological Arms race
  Vision was the root!
  Renaissance:Camera Obscura by Leonardo da Vinci– very simple architecture
  There is a hole to capture light and some kind of reflection to capture image
  Then film camcorders and what not came into being.
How does Vision work in our Biological Brain?
  Tons of neurons working on vision
  Primary Visual Cortex is furthest away from the eye. Vision is the hardest cognitive system – 50%.
  Cat was shown fish flower and there was very little spiking in Primary Visual Cortex. This was before computers, now with computers people noticed that there is spike in neurons only when there was a change between slides of fish and flower. The in–betweens has something to do with oriented edges of images and not what they are.
  Larry Roberts– Block World, talks about how edges define Computer Vision
  David Marr – Worked at MIT, wrote Vision.
  High Level Architecture
  Input Image –> Edges(2D) –> Layers (2.5D) –> 3D model
  First Wave of Visual Recognition Algos: Generalized Cylinder – Brooks 1979
  World is composed of cylinders and blocks and everything is composed of this
  Pictorial Structure: Objects are mode of still simple parts that are connect by springs(not really but in a way) that allow variability
  Normalized Cut– tough problem still unsolved.
  ImageNEt–1000 Images
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CNN is an important tool for object recognition which is super important for this course
Remember the visual world is more than labels like man/woman, to tell a story is what pictures are meant for.