For point (3)

For now, we are having a phone camera that would click the images of eyes and nails and correspondingly detect/predict sugar levels, blood pressure etc.

Further we can convert this into a scanner that can be attached to the phone and an android app can be made where the reports or the collected data by scanning can be predicted.

As discussed in point (2), we will get to know what other medical problems can be detected using simple scans.

(Moreover the idea can be generalised for animals as well)

For point (6)

**Optical coherence tomography** (**OCT**) is an imaging technique that uses [low-coherence](https://en.wikipedia.org/wiki/Coherence_(physics)) light to capture [micrometer](https://en.wikipedia.org/wiki/Micrometre)-resolution, two- and three-dimensional images from within [optical scattering](https://en.wikipedia.org/wiki/Scattering_(optics)) media (e.g., biological tissue). It is used for [medical imaging](https://en.wikipedia.org/wiki/Medical_imaging) and industrial [nondestructive testing](https://en.wikipedia.org/wiki/Nondestructive_testing) (NDT). Optical coherence tomography is based on low-coherence [interferometry](https://en.wikipedia.org/wiki/Interferometry), typically employing [near-infrared](https://en.wikipedia.org/wiki/Near-infrared) light. The use of relatively long [wavelength](https://en.wikipedia.org/wiki/Wavelength) light allows it to penetrate into the scattering medium. [Confocal microscopy](https://en.wikipedia.org/wiki/Confocal_microscopy), another optical technique, typically penetrates less deeply into the sample but with higher resolution.

Optical Coherence Tomography, or ‘OCT’, is a technique for obtaining sub-surface images of translucent or opaque materials at a resolution equivalent to a low-power microscope. It is effectively ‘optical ultrasound’, imaging reflections from within tissue to provide cross-sectional images.[[17]](https://en.wikipedia.org/wiki/Optical_coherence_tomography#cite_note-Michelessi-17)

OCT has attracted interest among the medical community because it provides tissue morphology imagery at a much higher resolution (better than 10 µm) than other imaging modalities such as MRI or ultrasound.

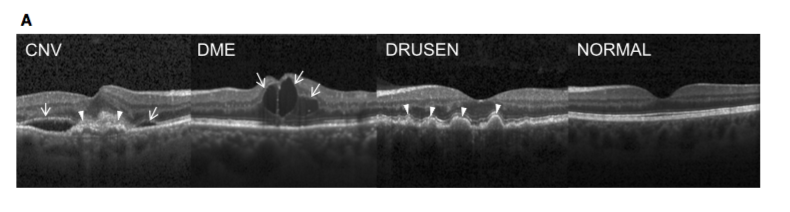
The key benefits of OCT are:

* Live sub-surface images at near-microscopic resolution
* Instant, direct imaging of tissue morphology
* No preparation of the sample or subject
* No ionizing radiation

OCT delivers high resolution because it is based on light, rather than sound or radio frequency. An optical beam is directed at the tissue, and a small portion of this light that reflects from subsurface features is collected. Note that most light is not reflected but, rather, scatters off at large angles. In conventional imaging, this diffusely scattered light contributes background that obscures an image. However, in OCT, a technique called interferometry is used to record the optical path length of received photons allowing rejection of most photons that scatter multiple times before detection. Thus OCT can build up clear 3D images of thick samples by rejecting background signal while collecting light directly reflected from surfaces of interest.

Within the range of noninvasive three-dimensional imaging techniques that have been introduced to the medical research community, OCT as an echo technique is similar to [ultrasound imaging](https://en.wikipedia.org/wiki/Ultrasound_imaging). Other medical imaging techniques such as computerized axial tomography, magnetic resonance imaging, or positron emission tomography do not use echo-location principle.[[18]](https://en.wikipedia.org/wiki/Optical_coherence_tomography#cite_note-18)

The technique is limited to imaging 1 to 2 mm below the surface in biological tissue, because at greater depths the proportion of light that escapes without scattering is too small to be detected. No special preparation of a biological specimen is required, and images can be obtained ‘non-contact’ or through a transparent window or membrane. It is also important to note that the laser output from the instruments is low – eye-safe near-infrared light is used – and no damage to the sample is therefore likely.



Optical coherence tomography (OCT) is a non-invasive technique with a large array of applications in clinical imaging and biological tissue visualization. However, the presence of speckle noise affects the analysis of OCT images and their diagnostic utility. In this article, we introduce a new OCT denoising algorithm. The proposed method is founded on a numerical optimization framework based on maximum-a-posteriori estimate of the noise-free OCT image. It combines a novel speckle noise model, derived from local statistics of empirical spectral domain OCT (SD-OCT) data, with a Huber variant of total variation regularization for edge preservation. The proposed approach exhibits satisfying results in terms of speckle noise reduction as well as edge preservation, at reduced computational cost.

**1.Choroidal neovascularization (CNV):**Choroidal neovascularization is the creation of new blood vessels in the [choroid](https://en.wikipedia.org/wiki/Choroid) layer of the [eye](https://en.wikipedia.org/wiki/Human_eye). Choroidal neovascularization is a common cause of neovascular degenerative maculopathy (i.e. ‘wet’ [macular degeneration](https://en.wikipedia.org/wiki/Macular_degeneration))[[1]](https://en.wikipedia.org/wiki/Choroidal_neovascularization#cite_note-1) commonly exacerbated by extreme myopia, malignant myopic degeneration, or age-related developments.

**2.Diabetic Macular Edema (DME):**

DME is a complication of diabetes caused by fluid accumulation in the macula that can affect the fovea. The macula is the central portion in the retina which is in the back of the eye and where vision is the sharpest. Vision loss from DME can progress over a period of months and make it impossible to focus clearly.

**3.Drusen:**

Drusen are yellow deposits under the [retina](https://www.aao.org/eye-health/anatomy/retina-list). Drusen are made up of lipids, a fatty protein. Drusen likely do not cause [age-related macular degeneration (AMD)](https://www.aao.org/eye-health/diseases/age-related-macular-degeneration). But having drusen increases a person’s risk of developing AMD. Drusen are made up of protein and calcium salts and generally appear in both eyes.

**4.Normal**

Normal vision occurs when light is focused directly on the retina rather than in front or behind it. A person with normal vision can see objects clearly near and faraway.

