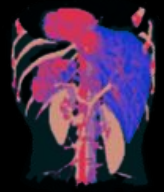


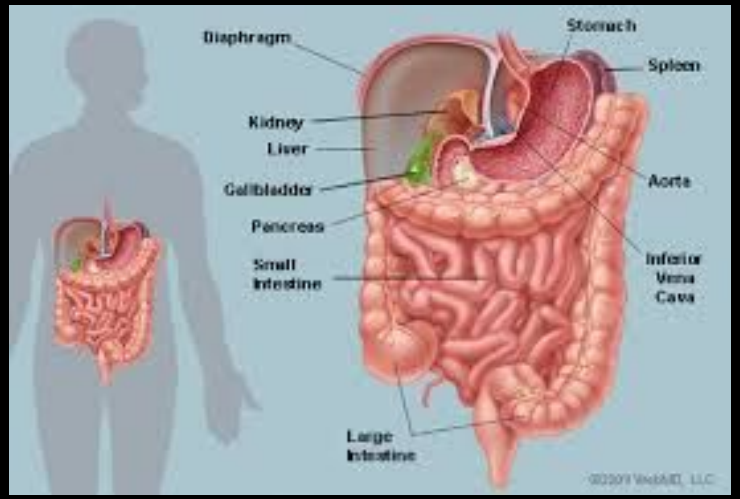
RealVol

The future of medical image visualisation.

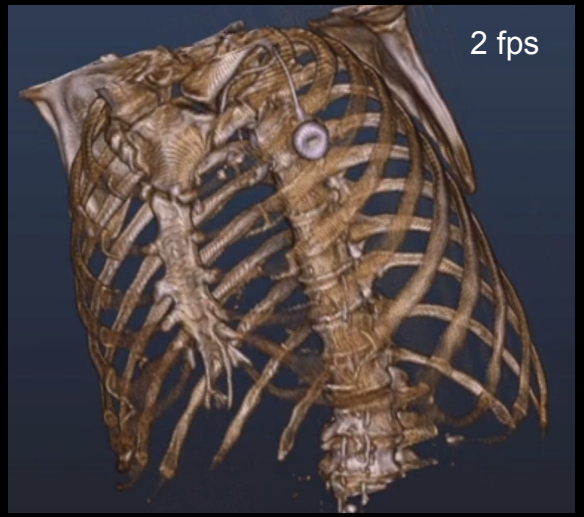
Palash Bansal

The need

2D scans



Hand Drawn fixed diagrams

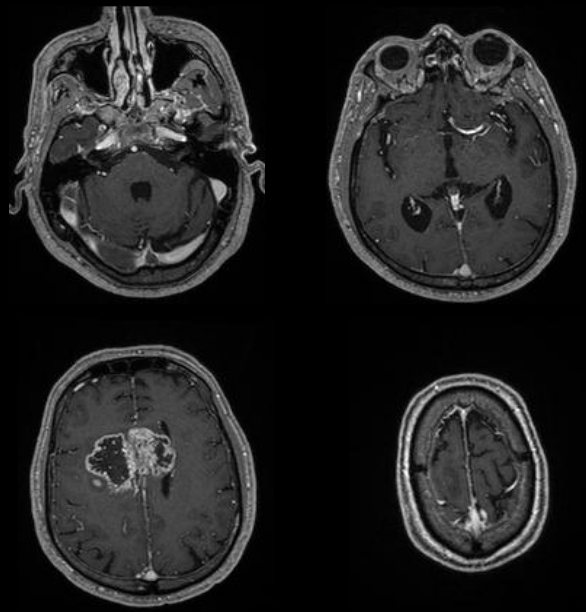


[Mobile] Basic rendering on 2D screens with complicated interactions

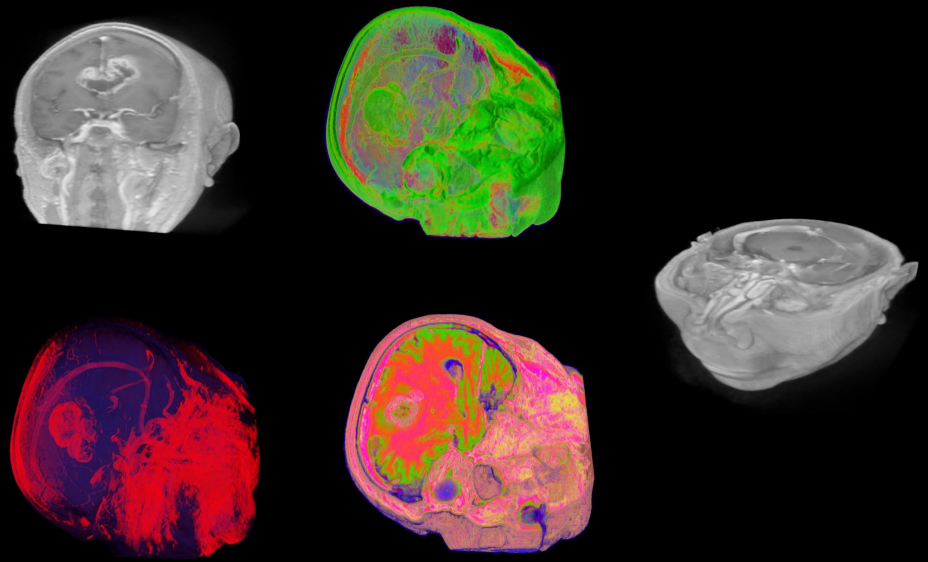
Current state of the art in
3D Anatomy Education and Radiology

We Can Do Better!!

CT scans and MRI: History



2D images of human body
20th century



3D reconstruction from images
21st century

21st Century - Welcome Virtual Reality

The future

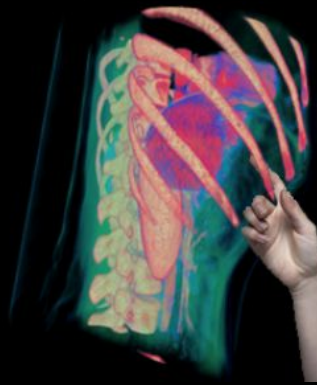
Concept images, taken from the internet

RealVol The Virtual Reality Product

CT/MRI Scans

Reconstructed volume

Colorized volume

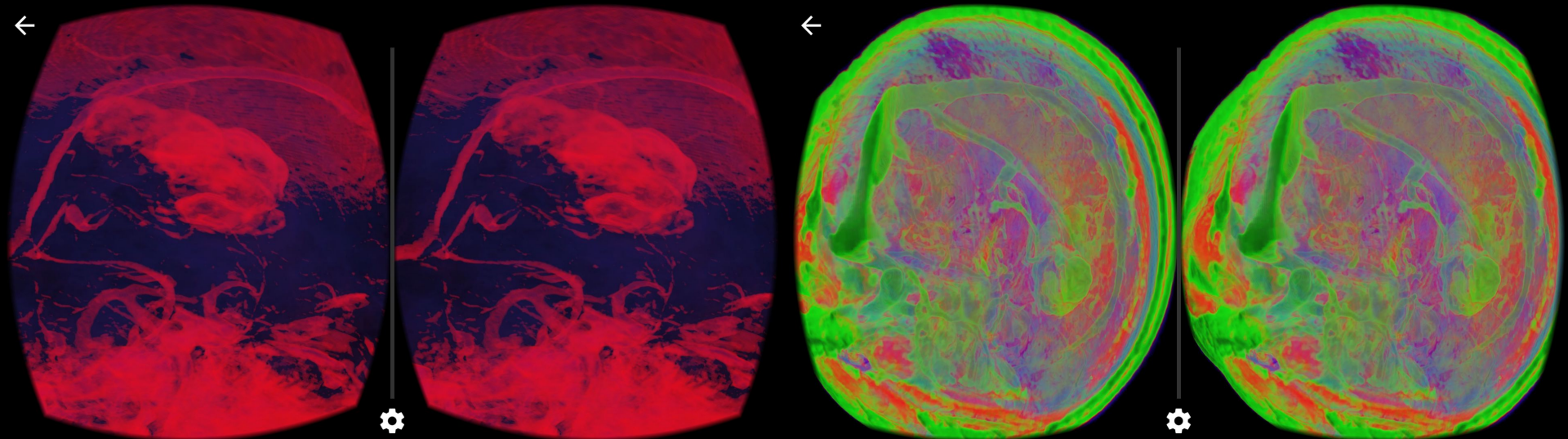


Interactive AR/VR Rendering

Both mobile and workstations with different DoF

Advanced AR/VR 3D viewing of real CT, MRI scans
The complete process is **automatic and real-time**.

Virtual Reality



Separate image generation for each eye

How?

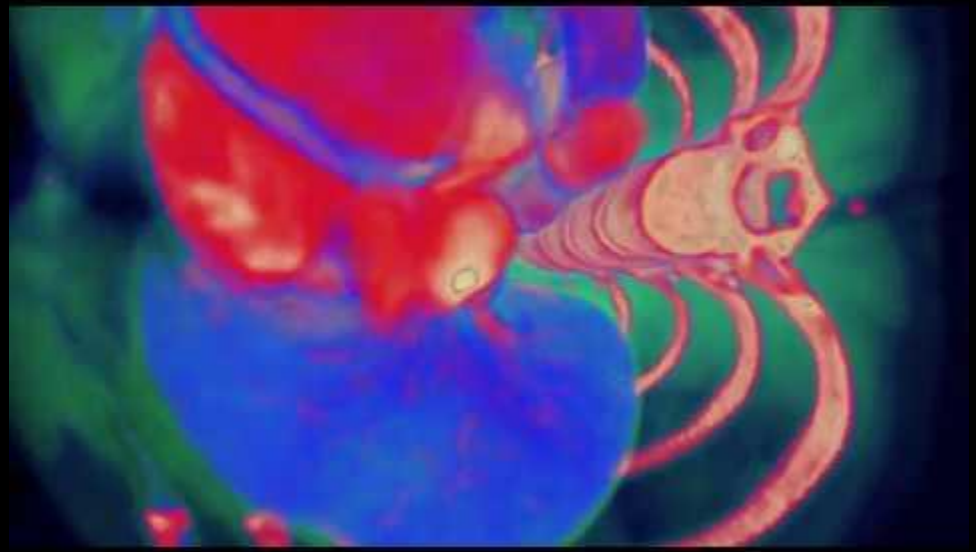
- We take **raw CT and MRI** images, lot of them
- These are then **reconstructed in 3D**, and rendered with our complete in-house software on Vive workstations.
- These can be **interacted** in a natural way with complete **9+ Degrees of Freedom**, using 3D hand held controllers.
- **3D** images can be **emailed**, and can be viewed using **any** Android or iOS device, using **RealVol mobile**.
- Complete 3D view is supported using **cheap headsets** like **Google Cardboard** and Daydream.

How accurate?

- RealVol uses **Medical Volume Rendering** algorithms to render the scans.
- It has been **proven** across the past decade, it is a very accurate algorithm to visualize the data.
- RealVol takes this further to visualize in **Virtual Reality Desktop** and on **Mobile** handheld devices.

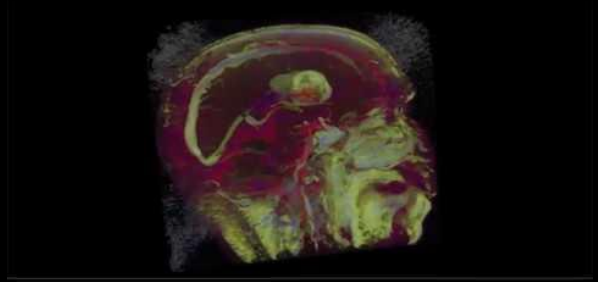
Desktop product

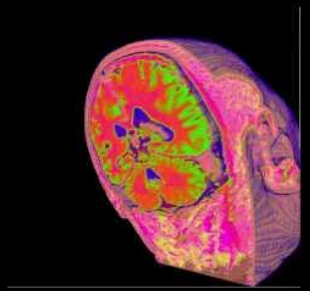
Fly-through



An operator flying through a CT scan in full virtual reality using HTC Vive Headset and controllers. Click on the video to play.

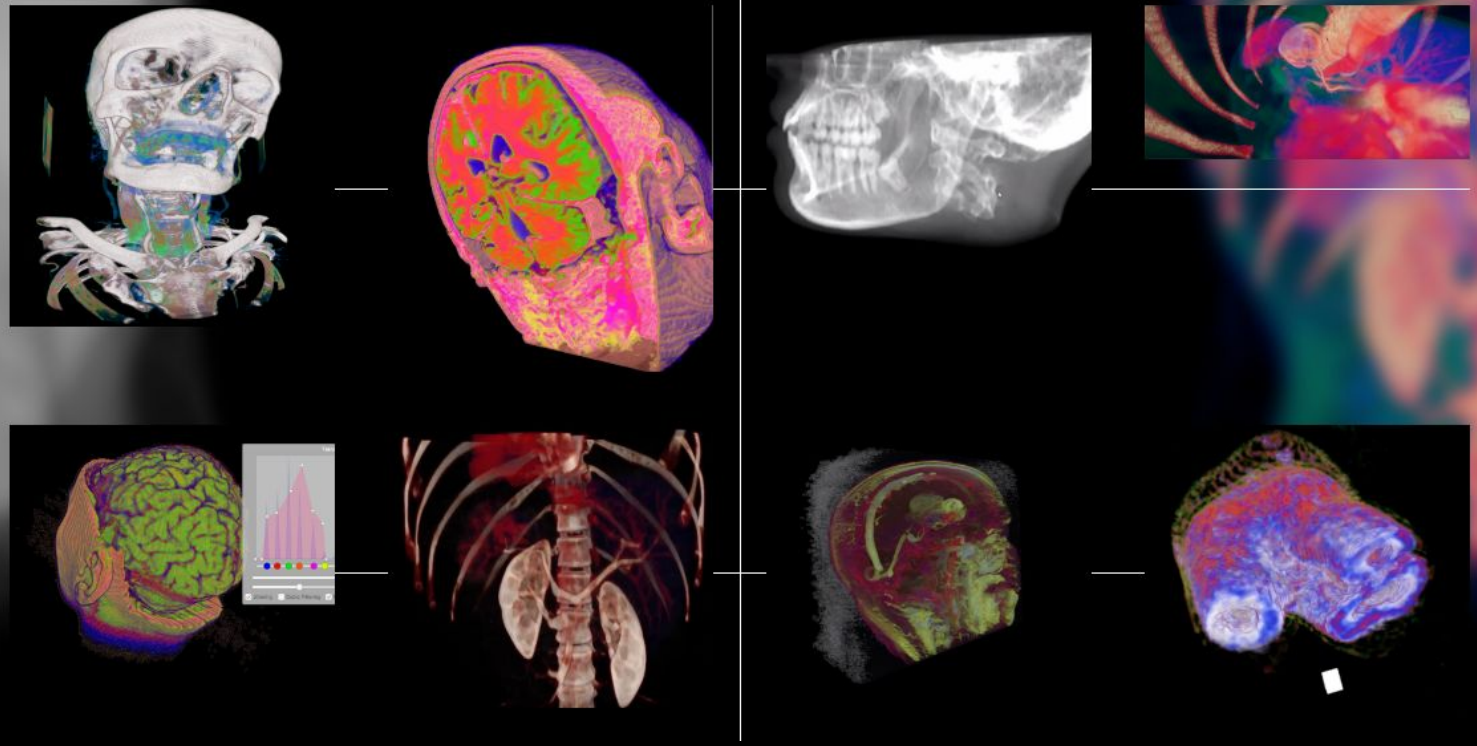
Demo reel





Small **sneaks**, click on the videos to play.

More renders - All real scans



Note: All images are generated in real-time

RealVol Mobile

- Precomputed models for teaching.
- Compatible with all android and iOS devices
- 3D, depth support - Google Cardboard- Rs 400 VR alternative, Daydream headset

Benefits and applications

- VR labs can be **setup in medical colleges** and hospitals where doctors and students can use this technology to **learn pathology**.
- This technology has the potential to **replace traditional plastic models** in colleges. This is generated from **real human scans** and is since **100% accurate**.
- This would help in diagnostics as unlike traditional methods, one can perceive **accurate depth** between objects, **walk inside** the scans, and can simulate non-invasive surgeries.

- RealVol Mobile has the potential to impact millions of people around the world by allowing a **fun and accessible** way to look at human scans.
- Patients and medical students can **take home data** and later refer to these on their own mobile devices.
- Doctors can use this technology at **field visits** and quickly refer to a recent scan or earlier annotated ones to check the relative positioning in human body.
- People can be **educated about human anatomy**, and **students in schools** can be augmented and motivated to explore medical studies.

Awards and Press mentions

RealVol won the **Microsoft Imagine Cup 2018** India Finals and will be presented at World Finals in July 2018 at Seattle, US.

RealVol was recently featured in news article on various sites:

- Financial Express: http://www.financialexpress.com/education-2/iiitd-student-develops-app-for-3d-interactive-viewing-of-ctmri-scans/1134014/
- India Today: https://www.indiatoday.in/education-today/news/story/iiitd-student-app-to-view-ct-and-mri-images-3d-1213360-2018-04-16
- Hindustan Times: https://m.hindustantimes.com/education/iiitd-student-develops-app-for-3d-interactive-viewing-of-ct-mri-scans/story-VdR6HePyWxK5YsbY8IptHL.html

RealVol Team

Palash Bansal

- Coding since the age of 12, working on Graphics and Medical Imaging for last 2.5 years.
- Interned at Adobe India and several early stage startups in ML, CV, Mobile Computing domains.
- Felicitated by Prime Minister Modi at International Cyber Security Conference, GCCS 17
- Top Innovator, Start JLM, India Israel Startup Meet.
- Visualisation and Collaboration Project Lead, Graphics Research Group, IIIT Delhi.
- Dean's List 2017 for student affairs in technical context.

Dr. Ojaswa Sharma

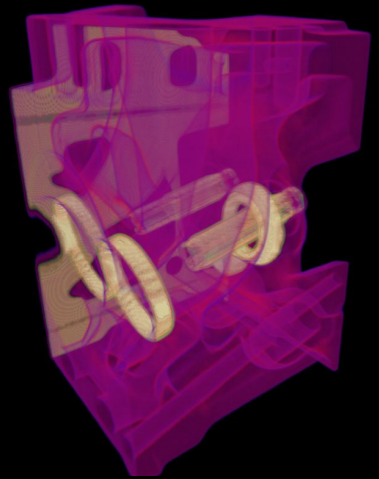
- PhD in Mathematics and Computer Science, Technical University of Denmark, Denmark
- Tech Mentor at RealVol, working closely on research aspects in VR/AR and visualisation.

Dr. Saurabh Kumar Gupta

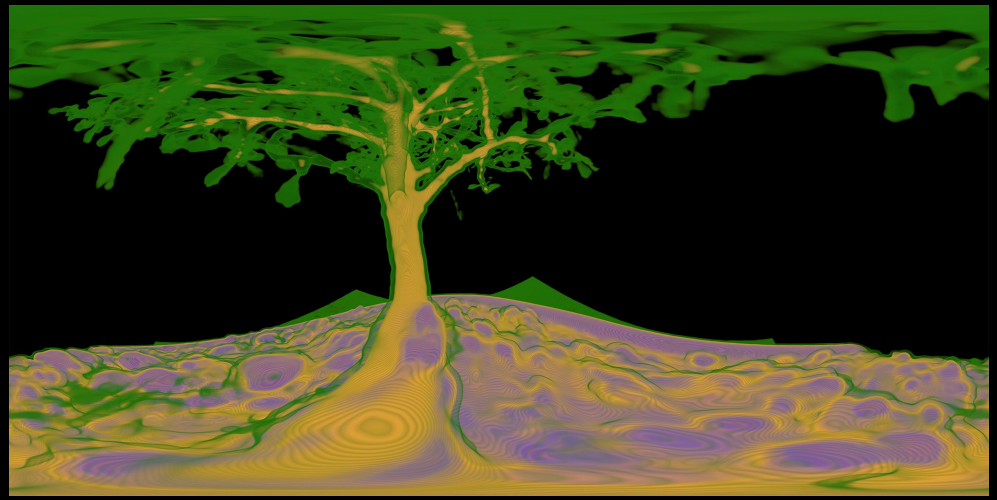
- MD, DM
- Consultant Pediatric Cardiologist
- Assistant Professor, Cardiology at AIIMS, Delhi
- Advisor at RealVol

Applications in engineering and research

- Medical scans are used widely to scan and test various other objects.
- The same technology can be used there.
- Volume Visualisation is also tremendously used with astronomical data.



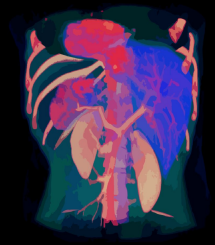
Visualisation of an engine



360 degree view of a bonsai tree

Thank you

Contact me



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Palash Bansal

Note:

All images and videos are generated and rendered using RealVol.

Some Medical scans belong to Pixmeo