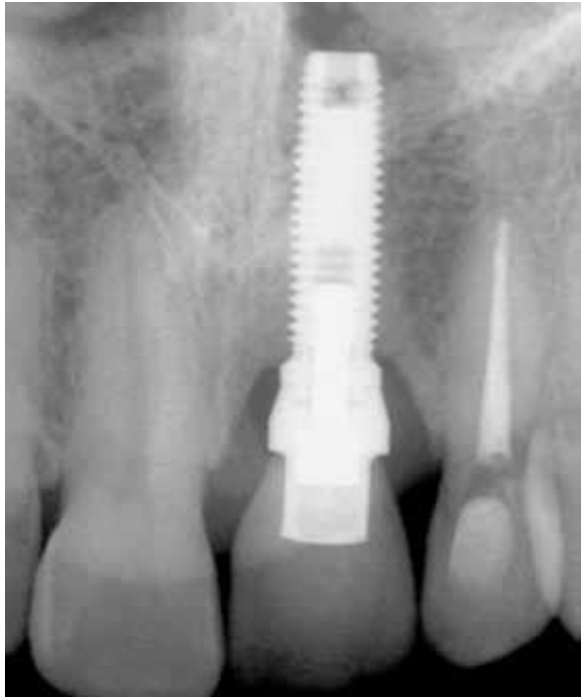


Network Enabled Medical Diagnosis and Education in Skeletal Imaging using X-Rays

Synergy of expertise of varied domains

- Medical and Dental disciplines
 - Dentistry-Orthodontics
 - Medicine-Orthopedics, Radiology
- Computational Methods
- CAD/Rapid Prototyping
- Image Processing & Pattern Recognition
- Medical Imaging



Dental Implant



Orthodontic Miniscrew



ions

NKN Model Project

NATIONAL
INFORMATICS
CENTRE **NIC**
THE IT SUPPORT PROFESSIONALS



- CollabCAD – CAD software developed by NIC
- Provides a collaborative framework for CAD professionals to work across a network
- Can concurrently access the same design for viewing and modification
- Extend to Biomedical Applications

- Create an Integrated Environment for Visualising Medical and Dental images for Diagnosis & Treatment Planning in an **Online Collaborative Environment**
- Create a repository of teaching files to aid Education & Research

- Enable the design and fabrication of customised medical implants using CT images/surface images

- Connect Primary Health Centres (PHC's) with expert radiologists and doctors in Centres of Excellence
- Provide experts a common platform to collaborate

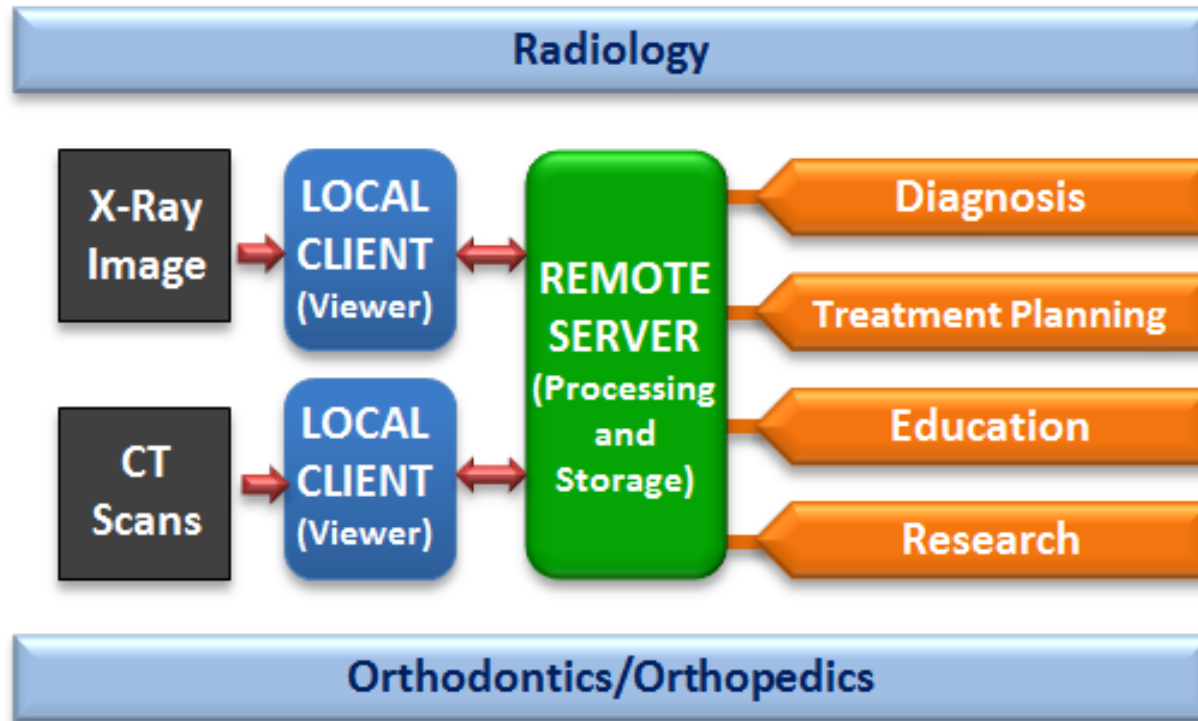
Project Aims

- Suitable ICT tools and channel
- Real time visual data transmission- HUGE

High-bandwidth and low-latency capability of the NKN provides an ideal platform

- CollabDDS: Collaborative Digital Diagnosis System - Network based system for diagnosis using X-Rays
 - Application to visualise X-rays and DICOM files
 - Transmitting digital x-ray images over Network
 - Collaboration in Real time
 - Tools to view and annotate images
 - Framework for Repository

Collaborative Digital Diagnosis System



System Requirements: OS: Windows or Linux, RAM 1 GB Minimum, Free Disk Space 1 GB



V1.0 Released on July 04, 2012

- Strength of such a system over telemedicine/web based consultation
 - **Real Time Collaborative Environment**
- Extreme value for both patients and primary level physicians in rural areas

- Efficient Digital Workflow of X-Ray Imaging
 - Improved Diagnosis
 - Better treatment through collaboration
-

- Enhancement of Quality of Medical Services in Rural Areas
- Reliability, Security and Accessibility of Medical Records
- Treatment based on Real Time Diagnosis
- Data base for Education and Research



002Pr.JPG



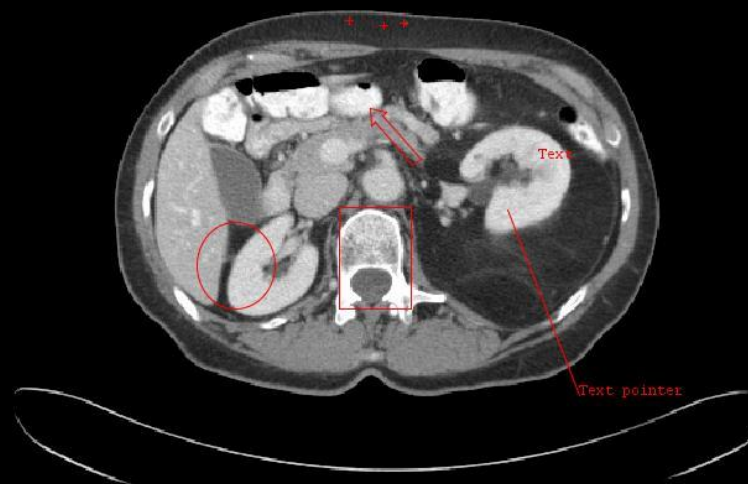
Image No: 2





case2a_001.dcm

Name: Fall 2
ID: 11788781116033
Date of Birth: 19000101
Sex: O
Body Part Examined: N/A
Slice: 152
Series Number: 2054




NEWUSER [23/10/2012 12:05] : comments

Add

Clear

PHASE II – Operational Research and Enhancement

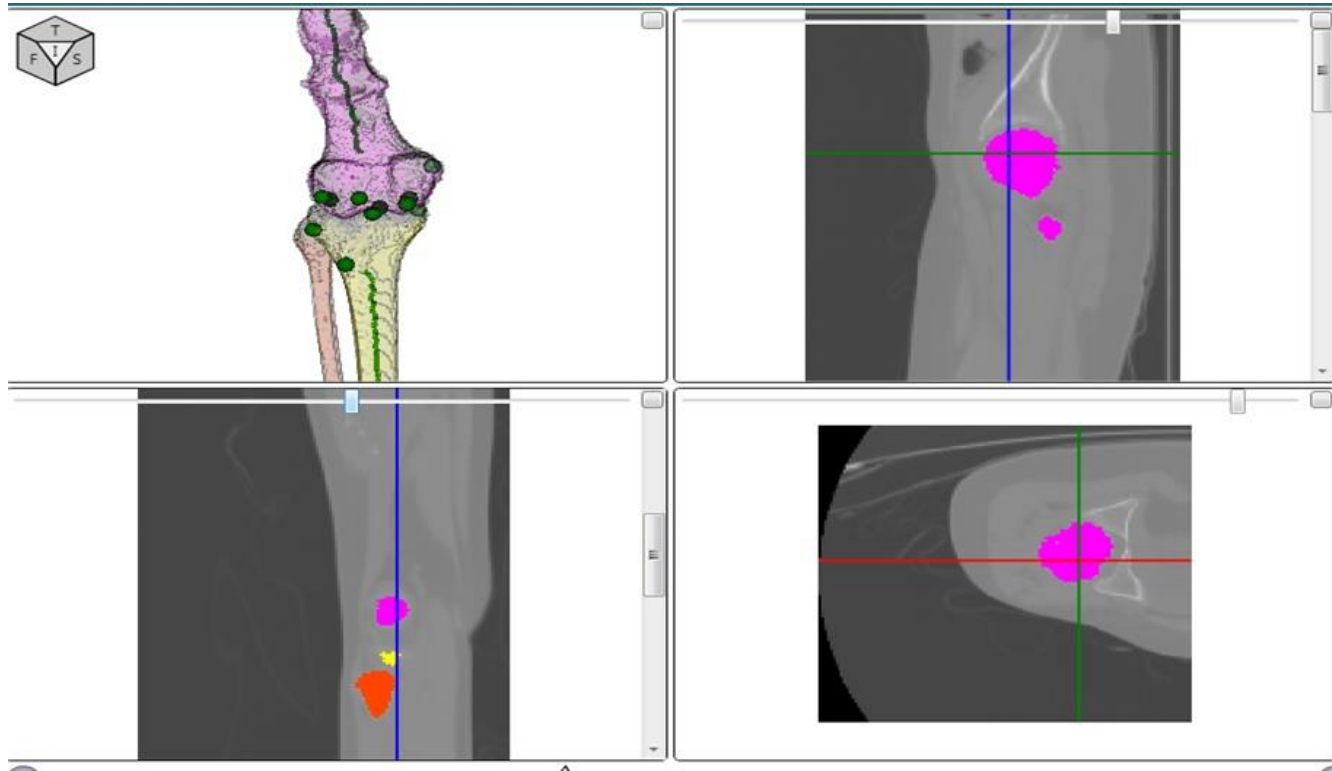
- Prelim to Rollout: Operational Research Phase
- Implementation of Collab DDS
Digital Diagnosis System
 - @ Medical and Dental Colleges and Hospital
 - Education network
 - @ Primary Health Centres
 - Expert consultation

- Evaluate efficiency and Effectiveness of Remote Diagnosis
- Creation of Repository of Teaching files for Education and Training purposes

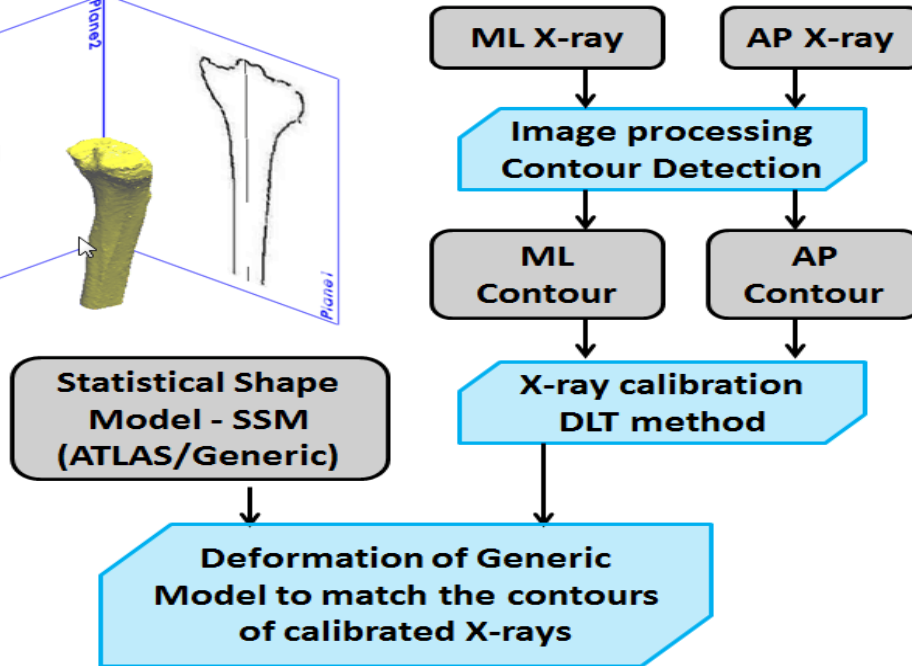
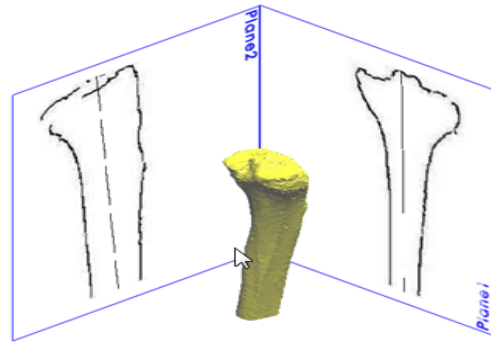
Enhancement of CollabDDS:

- Enable reconstruction of 3D models
- Methodology for design and fabrication of medical /Dental devices
- Repository for Education & Training

PHASE II –3D Reconstruction from CT Scans



3D reconstruction Method from X-rays



Algorithms

- **Canny Edge**
- **Snakes / Active contour**

- **DLT-Direct Linear Transform**

- **NSCP**
- **NSCC**
- **Layerwise scaling (In our Research)**

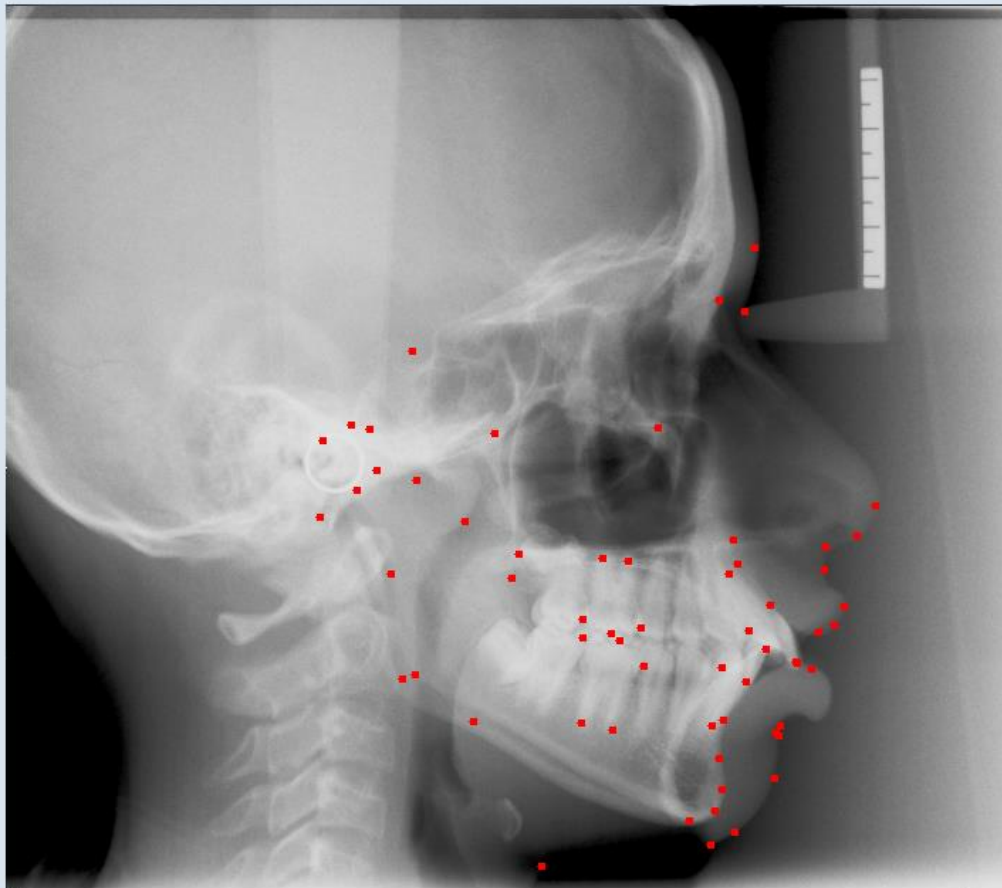
- Integrating AutoCEPH with CollabDDS
 - Computerized Cephalogram Analysis for Orthodontics
 - Generates Manual and Automatic Cephalometric Landmarks for Analysis
 - Developed by CSIO & AIIMS- CDER

☐ Selected Zoom**ToolBox**☐ Acc. to Analysis ☒ All Landmarks☐ Auto

Select Landmark

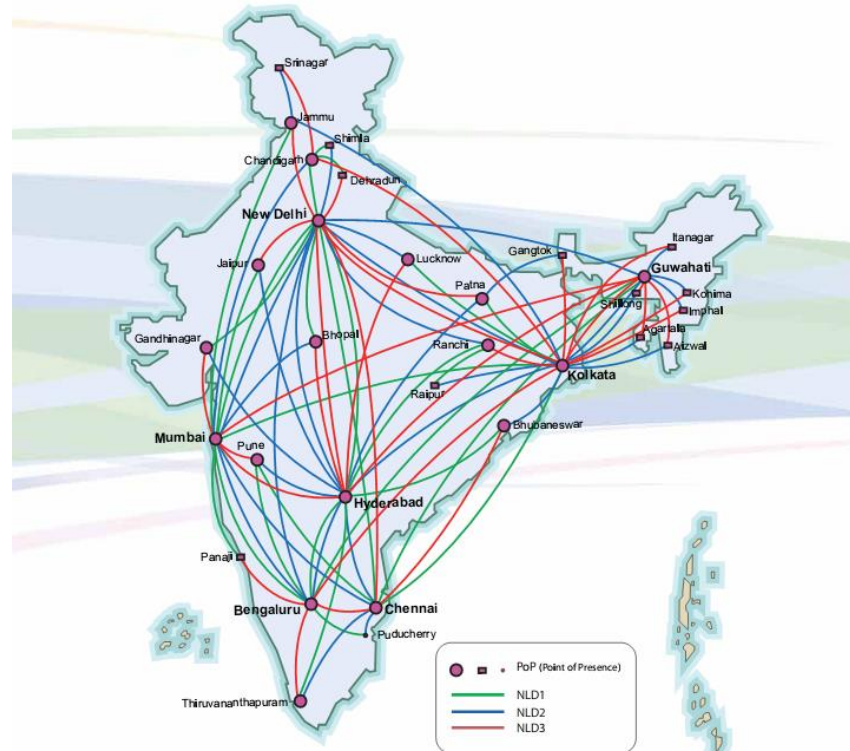
Landmarks for Molar-Incisor

Select Landmark



Lateral Cephalogram

NKN



Thank you!

CollabCAD Group, NIC, New Delhi

Department of Orthodontics, CDER, AIIMS, New Delhi

Department of Radio Diagnosis, AIIMS, New Delhi

OrthoCAD Group, Mechanical Engg, IITB, Mumbai

Central Scientific Instruments Organisation, Chandigarh