

# Vikas Karade

Ph.D. research scholar at IIT-Bombay

DoB: 26<sup>th</sup> Jan 1987, Age: 27

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## Education

**Ph.D. in Mechanical Engineering, IIT-Bombay** 2011 - 2015

3D Bone Model Reconstruction from X-ray Images

**B.Tech. + M.Tech. in Mechanical Engineering, IIT-Bombay** 2005 - 2010

Design of surgical instrumentation for accurate total knee replacement surgery.

*Specialization:* Computer Integrated Manufacturing

## Awards and Honors

2015 - Selected among the top 10 innovations in the country for **Innovation Scholar In-Residence Program, Rashtrapati Bhavan**

2015 - Gold medalist in **India Innovation Growth Programme** organized by DST, Stanford Business School, Lockheed Martin and FICCI.

2014 - **National Award** - Gandhian Young Technological Innovation

2014 - Selected among the **top 10 innovations in the country** for a national competition organized by Times group and Dupont Inc., featured at Economic Times TV channel

2014 - Post Graduate Research Award - Mechanical Engineering Department, IIT Bombay

2008 - Institute Technical Color Award - IIT Bombay

## Projects

**CollabDDS Software- NKN X-ray Project** May 2011 - Present

*IIT-Bombay, NIC-Delhi, AIIMS-Delhi and CSIO-Chandigarh* (3 years)

A multidisciplinary collaborative project to create Collaborative Digital Diagnosis System software for real time tele-radiology platform with enhanced 3D visualization

**Software Product Development - Orthopaedic Precision Finesse** May 2013 - Oct 2013

*Radinik Technologies and Dr. Vijay Panchanadikar* (6 months)

X-ray image based intra-operative surgical guidance software for orthopedic surgeries involving bone fracture treatment with screw implants.

**Walking Robot Kit - Internship Project** May 2008 - Dec 2008

*ThinkLabs, TRI Pvt. Ltd* (8 months)

Conceptualization, design, prototyping, manufacturing and sales of a novel 3-in-1 kit of walking robots, twice cheaper than other robotic kits in the market.

**E-Foundry - Part Time Project** May 2012 - May 2014

*Efoundry Lab, IIT Bombay* (2 years)

E-Foundry project includes web-based ([efoundry.iitb.ac.in](http://efoundry.iitb.ac.in)) learning resources in casting design and simulation and onsite teacher training program

## Patents

Karade, V., "Tabplan3D & XrayTo3D: A Portable System and Method for 3-Dimensional Surgery Planning using Conventional 2-Dimensional X-Ray Images," *Indian Patent*, 199/MUM/2015.

Karade, V. and Ravi, B., "An Unerring Alignment and Resection Guide Assembly," *Indian Patent*, 85/MUM/2012.

Karade, V., Tapadia, R., Ravi, B. and Shetty, V., "Modular Femoral Patient Specific Jig for Total Knee Arthroplasty," *Indian Patent*, 2574/MUM/2012.

## Publications

Karade, V., Ravi, B., "3D Femur Model Reconstruction from Bi-plane X-ray Images: A novel method based on Laplacian Surface Deformation for Template Reconfiguration," *International Journal of Computer Assisted Radiology and Surgery*, 10(4) (2015), 473-485.

Karade, V., Ravi, B., "Analysis of Anatomical References to Assess the Coronal Alignment of Tibial and Femoral Cut in Knee Replacement," *International Journal of Orthopaedics and Traumatology*, 15(2) (2014), 87-93.

Karade, V., Ravi, B., Agarwal, M., "Extramedullary versus Intramedullary Tibial Cutting Guides in Megaprosthesis Total Knee Replacement," *International Journal of Orthopaedic Surgery and Research*, 7(33) (2012).

Karade, V., Ravi, B., "Application of Laplacian Surface Deformation and Self-Organizing Maps to Calculate Shape Correspondence for Statistical Shape Modeling," in *Proceedings of IEEE International Symposium on Biomedical Imaging*, Beijing-China, IEEE-ISBI-2014, pp. 369-372.

Karade, V., Ravi, B., "Automatic method to determine anatomical coordinate systems for 3D bone models of isolated arthritic knee," presented at *6th European Conference of the International Federation for Medical and Biological Engineering*, Dubrovnik-Croatia, IFMBE-MBEC-2014.

Karade, V., Ravi, B., "XrayTo3D: Conversion of 2D X-ray Images into 3D Bone Models using Novel Algorithm," presented at *3rd International Conference on Creativity & Innovation at Grassroots*, Ahmedabad-India, ICCIG -2015.

Karade, V., Ravi, B., "3D Pose Estimation and Model Reconstruction of Femur from Single X-ray Image," under review in *37<sup>th</sup> International conference of the IEEE Engineering in Medicine and Biology Society*, IEEE-EMBS-2015.