# SUTHAMBHARA N

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## EDUCATION

Ph.D. (Jan-2007– 2011(expected)), Computer Science and Automation, Indian Institute of Science, Bangalore.
Thesis: Visual analysis of interactions in multifield scientific data.
Advisor: Dr. Vijay Natarajan.
C.G.P.A: 7.8/8.0.
Courses : Advanced Algorithms, Topics in Algorithms, Compilers, Topological methods in Visualization, Computer Graphics, Distributed Computing.

B.E., June 2004, Computer Science,
Sri Jayachamarajendra College of engg, Mysore.
83% (first class with distinction).

## RESEARCH INTERESTS

Topology-based methods in visualization, scientific visualization, computational topology and computer graphics.

## RESEARCH SYNOPSIS

Data from present day scientific simulations and observations of physical processes often consist of multiple scalar fields. It is important to study the interactions between the fields to understand the underlying phenomena. The gradients of the individual scalar fields and their mutual alignment is a good indicator of the relationships between the different scalar variables. The Jacobi set, defined as the set of points where the gradients are linearly dependent, captures the relationship between the gradients fields. For two dimensional domains, we describe a technique to create multiresolution representations of the Jacobi set and use it to study real world applications. We also introduce a variation density function and a gradient based comparison measure that helps in locating important isosurfaces and regions of interest. Subsequent visualization of the data focuses on these regions of interest leading to effective visual analysis.

## PUBLICATIONS

- Suthambhara N, Vijay Natarajan and Ravi S Nanjundiah. A Gradient-Based Comparison Measure for Visual analysis of Multifield Data. Computer Graphics Forum (EuroVis 2011), 30(3), 2011, 1101-1110. *Third best paper award*

- Suthambhara N. and Vijay Natarajan. Relation-aware isosurface extraction in multi-field data. IEEE Transactions on Visualization and Computer Graphics, 17(2), 2011, 182-191

- Suthambhara N. and Vijay Natarajan. Simplification of Jacobi sets. In Topological Data Analysis and Visualization: Theory, Algorithms and Applications. Valerio Pascucci, Xavier Tricoche, Hans Hagen, and Julien Tierny (editors), Springer-Verlag, Mathematics and Visualization Series, 2011, 91-102.

## COMPUTING SKILL SET
Languages : C, C++, C# (.NET), python.
Libraries : OpenGL/GLSL, OpenCL, QT, NumPy/SciPy and VTK.

## EMPLOYMENT
**2004-2007**
Senior Software Engineer,
Philips Healthcare,
Philips Software Centre,
Bangalore.

**Summary of work done at Philips Healthcare :**

- I was part of a team comprising of three members that developed and maintained a graphics accelerated viewer for the diffusion tensor MRI-based fiber tracking package (part of Philips Intera MRI systems). Graphics acceleration was implemented using the Microsoft DirectX library. The viewer was developed with the intention of reconstructing and studying brain fibers from an (DT)MRI scan.

- I developed a graphics accelerated volume renderer to render large scale medical datasets. This volume renderer became a part of the Philps Medical Workspot. New ideas involving volume subdivision techniques (bricking) were developed to enable the graphics processor to handle very large volumes.

## OTHERS

- Awarded MHRD scholarship by the Govt of India.

- Part of a team of three which was placed 6th at the ACM ICPC regional programming contest, IIT Rourkee, 2003.

## CONTACT
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## REFERENCES
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Department of Computer Science and Automation,
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Dr Kavitha Telikepalli,
School of Technology and Computer Science,
Tata Institute of Fundamental Research,
Homi Bhabha Road,
Mumbai 400 005

Prof. Y.N. Srikant,
Department of Computer Science and Automation,
Indian Institute of Science.