MAHARAVO H. RANDRIANARIVONY

EDUCATION:

Technical University of Chemnitz, Germany
Ph. D. in Computer Science. *2006*
Supervisor: Prof. Guido Brunnett.

Technical University of Chemnitz, Germany
M. Sc. in Mathematics with minors in Computer Science. *2001*
Supervisor: Prof. Thomas Apel.

RESEARCH INTERESTS (NUMERICAL MODELING AND SIMULATION):

Higher order Finite Element Method (FEM).

A-posteriori estimates and adaptive error control of PDE (Partial Differential Equation).

Geometric modeling and nonuniform rational B-splines for hypersurfaces.

Mesh processing on manifold/solid/assembly: generation, parametrization, refinement, smoothing.

Boundary Element Method (BEM) for singular integral equations on compact manifolds.

Multi-wavelets on geometric manifolds and matrix compression.

Scientific visualization, Computer Aided Design (CAD) and applications.

PUBLICATIONS:

NEW:

1. Title : **FEM polynomial inverse estimates and elastostatic higher order estimator.**
Author : M. Randrianarivony.

2. Title : **Adaptive mesh for elasticity under traction boundary condition using higher order FEM.**
Author : M. Randrianarivony.

3. Title : **On a multilevel parallel solver for higher order FEM on elliptic systems.**
Author : M. Randrianarivony.

OLD:

1. Title : **From Computer Aided Design to wavelet BEM.**
Authors : H. Harbrecht, M. Randrianarivony.
Reference : *Journal of Computing and Visualization in Science, Volume 13, Number 2, Pages 69–82, Year 2010.*

2. Title : **On global continuity of Coons mappings in patching CAD surfaces**.
Author : M. Randrianarivony.
Reference : *Computer Aided Design, Volume 41, Pages 782–791, Year 2009.*

3. Title : **Adaptive discontinuous Galerkin B-spline on parameteric geometries**.
Author : M. Randrianarivony.
Reference : *Lecture Notes in Computer Science, Volume 6785, Pages 59–74, Year 2011.*

4. Title : **On transfinite interpolations with respect to convex domains**.
Author : M. Randrianarivony.
Reference : *Computer Aided Geometric Design, Volume 28, Number 2, Pages 135–149, Year 2011.*

5. Title : **Domain decomposition for wavelet single layer on geometries with patches**.
Author : M. Randrianarivony.
Reference : *Applied Mathematics, Volume 7, Number 15, Pages 1798–1823, Year 2016.*

6. Title : **Parallel processing of analytical Poisson-Boltzmann using higher order FEM**.
Author : M. Randrianarivony.
Reference : *ACTA Press, Number 455434, Pages 1–6, Year 2013.*

7. Title : **On space enrichment estimator for nonlinear Poisson-Boltzmann**.
Author : M. Randrianarivony.
Reference : *American Institute of Physics, Volume 1558, Pages 2365–2369, Year 2013.*

8. Title : **On DFT molecular simulation for non-adaptive kernel approximation**.
Author : M. Randrianarivony.
Reference : *Advances in Material Physics and Chemistry, Volume 4, Pages 105–115, Year 2014.*

9. Title : **Wavelet BEM on molecular surfaces: Solvent Excluded Surfaces**.
Authors : H. Harbrecht, M. Randrianarivony.
Reference : *Computing, Volume 92, Number 4, Pages 335–364, Year 2011.*

10. Title : **Quasi-optimal local refinements for Isogeometric Analysis in two and three dimensions**.
Author : M. Randrianarivony.
Reference : *LOGOS Verlag, Manuscript, Pages 1–75, Year 2010.*

11. Title : **Arc length of rational Bézier curves and use for CAD reparametrization**.
Author : M. Randrianarivony.
Reference : *Proceeding Fifth International Conference on Computational Geometry, Italy, Pages 173–178, Year 2008.*

12. Title : **Cavity generation of Connolly surfaces for subsequent patchwise chemical Polarizable Continuum Model simulation**.
Author : M. Randrianarivony.
Reference : *Preprint Number 1001, Institute for Numerical Simulation, Year 2010.*

13. Title : **Harmonic variation of edge size in meshing CAD geometries from IGES format**.
Author : M. Randrianarivony.
Reference : *Lecture Notes in Computer Science, Volume 5102, Pages 56–65, Year 2008.*

14. Title : **A finite element study on the effect of curvature on the reinforcement of matrices by randomly distributed and curved nanotubes**.
Authors : C. Diedrich, D. Dijkstra, J. Hamaekers, B. Henninger, M. Randrianarivony.
Reference : *Journal of Computational and Theoretical Nanoscience, Volume 12, Pages 2108–2116, Year 2015.*

15. Title : **Molecular dynamics for two-body potential from unobserved Gaussian regression**.
Author : M. Randrianarivony.
Reference : *Journal of Materials Science Research, Volume 3, Number 4, Pages 38–52, Year 2014.*

16. Title : **Software pertaining to the preparation of CAD data from IGES interface for mesh-free and mesh-based numerical solvers**.
Author : M. Randrianarivony.
Reference : *Chemnitz archive MONARCH 0026-2007, Year 2007.*

17. Title : **Preparation of CAD and molecular surfaces for meshfree solvers**.
Authors : M. Randrianarivony, G. Brunnett.
Reference : *Lecture Notes in Computational Science and Engineering, Volume 65, Pages 231–245, Year 2008.*

18. Title : **Stability of the discretizations of the Stokes problem on anisotropic meshes**.
Authors : T. Apel, M. Randrianarivony.
Reference : *Mathematics and Computers in Simulation, Volume 61, Numbers 3-6, Pages 437–447, Year 2003.*

19. Title : **Error Estimator Using Higher Order Finite Element Method for an Interface Problem**.
Author : M. Randrianarivony.
Reference : *Applied Mathematics, Volume 8, Number 12, Pages 1769-1794, Year 2017.*

20. Title : **On the generation of hierarchical meshes for multilevel FEM and BEM solvers from CAD data**.
Author : M. Randrianarivony.
Reference : *Proceeding 18th International conference on the Application of Computer Science and mathematics in Architecture and civil Engineering, Weimar, Germany, ISSN: 1611-4086, Year 2009.*

21. Title : **Wavelet formulation of the Polarizable Continuum Model**.
Authors : V. Weijo, M. Randrianarivony, H. Harbrecht, L. Frediani.
Reference : *Journal of Computational Chemistry, Volume 31, Number 7, Pages 1469–1477, Year 2010.*

22. Title : **Quadrilateral decomposition by two-ear property resulting in CAD segmentation**.
Author : M. Randrianarivony.
Reference : *Proceeding Fifth International Conference on Computational Geometry, Italy, Pages 179–185, Year 2008.*

23. Title : **Multilevel B-Spline repulsive energy in nanomodeling of graphenes**.
Author : M. Randrianarivony.
Reference : *Journal of Surface Engineered Materials and Advanced Technology, Volume 4, Pages 75–86, Year 2014.*

24. Title : **Generating well behaved meshes for parameterized surfaces**.
Authors : M. Randrianarivony, G. Brunnett.
Reference : *IEEE Computer Society, Volume PR01985, Pages 56–61, Year 2003.*

25. Title : **A multiresolution method for detecting higher order discontinuities from irregular noisy samples**.
Authors : M. Randrianarivony, G. Brunnett.
Reference : *Nashboro Press, Pages 333–342, Year 2003.*

26. Title : **Wavelet BEM on molecular surfaces: parametrization and implementation**.
Authors : H. Harbrecht, M. Randrianarivony.
Reference : *Computing, Volume 86, Pages 1–22, Year 2009.*

27. Title : **Multiwavelet Boundary Element Method for cavities admitting many NURBS patches**.
Author : M. Randrianarivony.
Reference : *Modeling and Numerical Simulation, Volume 6, Number 4, Pages 69–93, Year 2016.*

28. Title : **Analytical Polarizable Continuum Model for Wavelets on NURBS Patches**.
Author : M. Randrianarivony.
Reference : *Applied Mathematics, Volume 8, Number 8, Pages 1045-1073, Year 2017.*

29. Title : **B-spline wavelet integral computations on patched manifolds**.
Author : M. Randrianarivony.
Reference : In preparation.

30. Title : **Molecular surface decomposition using graphical modeling**.
Authors : M. Randrianarivony, G. Brunnett.
Reference : *Conference Bildverarbeitung für die Medizin, Berlin Germany, Springer Verlag, Pages 197–201, Year 2008.*

31. Title : **Treatment of general domains in two space dimensions in a partition of unity method**.
Authors : M. A. Schweitzer, M. Randrianarivony.
Reference : *Lecture Notes in Computational Science and Engineering, Volume 79, Pages 27–49, Year 2011.*

32. Title : **Anisotropic finite elements for the Stokes problem: a-posteriori error estimator and adaptive mesh**.
Author : M. Randrianarivony.
Reference : *Journal of Computational and Applied Mathematics, Volume 169, Number 2, Pages 255–275, Year 2004.*

33. Title : **Approximation by NURBS curves with free knots**.
Authors : M. Randrianarivony, G. Brunnett.
Reference : *Conference Vision Modeling and Visualization, Erlangen Germany, Akademische Verlagsgesellschaft AKA, Pages 195–202, Year 2002.*

34. Title : **Geometric processing of CAD data and meshes as input of integral equation solvers**.
Author : M. Randrianarivony (supervised by Prof. G. Brunnett).
Reference : *Ph.D. thesis, Faculty of Computer Science, Technical University of Chemnitz, Germany, Pages 1–217, Year 2006.*

35. Title : **Stability of mixed Finite Element Method with anisotropic mesh**.
Author : M. Randrianarivony (supervised by Prof. T. Apel).
Reference : *Master's thesis, Faculty of Mathematics, Technical University of Chemnitz, Germany, Pages 1–130, Year 2001.*

SOFT SKILLS:

Programming	C/C++, Matlab, Python, Fortran, Java. C-Python interface using SWIG or PythonObjects. C-Matlab interface using MEX.
Visualization	OpenGL, GLUT, GLUI, VMD.
Graphical User Interface (GUI)	MFC, Win32, Qt.
Parallel processing	load balancing, interprocess communication, speedup, multi-threads, message passing, client-server programming, process forking.
Scripting and documentation	shell script, Makefile, cmake, doxygen.
Computer Aided Design (CAD)	CAD interface: IGES, STEP. CAD system: Pro-Engineer, Rhino, CATIA.
Finite Element Method (FEM)	Salomé, CodeAster, OOF2,...
Geometric kernel	ACIS, OpenCASCADE.
Applications	Latex, MAPLE, MS Word, CorelDraw, GIMP,...
Operating system	Windows, Linux.

RECENT COMPUTER IMPLEMENTATIONS:

Parallel higher order Finite Element Method

Multi-processor Wavelet BEM package

Clementine: modeling of molecular microgeometry

Finite Element Method for Stokes flow

Geometric library

MISCELLANEOUS:

Hobbies	Guitar playing, internet, listening to musics (formerly table tennis, basket ball).
Languages	English, Malagasi, French, German.
Contact	maharavo@gmx.de
Homepage	www.xdomitri.com
Religion	Formerly Protestant, then 7th-day Adventist. Currently Atheist.