



# UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: [math@ugm.ac.id](mailto:math@ugm.ac.id) Website: [matematika.fmipa.ugm.ac.id](http://matematika.fmipa.ugm.ac.id)

## Undergraduate Programme in Mathematics

Telp : +62 274 552243

Email : [maths1@ugm.ac.id](mailto:maths1@ugm.ac.id); [kaprodi-s1-matematika.mipa@ugm.ac.id](mailto:kaprodi-s1-matematika.mipa@ugm.ac.id)

[sekprodi-s1-matematika.mipa@ugm.ac.id](mailto:sekprodi-s1-matematika.mipa@ugm.ac.id)

Website : <http://s1math.fmipa.ugm.ac.id/>

## STAFF HANDBOOK

Name	Zenith Purisha			
Position	Applied Mathematics			
Academic Career		Institution	Year	
	Initial Academic Appointment	Universitas Gadjah Mada	2011	
	Post Doctoral	-	-	
	Doctoral Degree	University of Helsinki	2018	
	Master Degree	Universitas Gadjah Mada	2011	
	Undergraduate Degree	Universitas Gadjah Mada	2008	
Employment		Position	Employer	Period
	Tenaga Pengajar	Universitas Gadjah Mada		2011 - present
	Instructor			
	Assistant Professor			
	Associate Professor			
	Full Professor			
Research and development projects over the last 5 years	<p>1. Sparse X-ray tomography problem is the main focus of my research. A new algorithm and some new implementations to get good reconstruction from the data has been done. Real data produced by CT/<math>\mu</math>CT machine are tested. State-of-art and modern methods, e.g Barzilai Borwein, Chambolle-Pock &amp; Shearlet for studying bone morphology are implemented. The purpose is to classify the quality of the bone whether it is healthy or osteoarthritic. The samples were harvested from patients going to total knee replacement surgery. The shearlet-based methods using automatic regularization parameter choice work quite well, it outperforms than FDK reconstruction for sparser projection images.</p> <p>Collaborators :</p> <p>Sakari Karhula - Juuso Ketola - Simo Saarakkala - Miika T. Nieminen : Department of Medical Technology, Faculty of Medicine, Department of Radiology, University of Oulu and Oulu University Hospital.</p> <p>Juho Rimpeläinen - Samuli Siltanen : Department of Mathematics and Statistics, University of Helsinki</p> <p>2. Another research is to reconstruct a two-dimensional sparse-data</p>			



Important publications over the last 5 years	Selected recent publications form a total of approx.: 6		
	Purisha, Zenith, and Samuli Siltanen. "Tomographic Inversion using NURBS and MCMC." <i>Forging Connections between Computational Mathematics and Computational Geometry</i> . Springer, Cham, 2016. 153-166.		
	Purisha, Zenith, and Samuli Siltanen. "Tomographic Reconstruction of Homogeneous 2D Geometric Models with Unknown Attenuation." <i>IFIP Conference on System Modeling and Optimization</i> . Springer Berlin Heidelberg, 2013.		
	Haario, H., Kallonen, A., Laine, M., Niemi, E., Purisha, Z., & Siltanen, S. (2016). Shape recovery from sparse tomographic X-ray data. <i>arXiv preprint arXiv:1605.01285</i> .		
	Zenith Purisha, Sakari Karhula, Juuso Ketola, Juho Rimpeläinen, Miika T. Nieminen, Simo Saarakkala and Samuli Siltanen <i>Accelerated-scan X-ray microtomography for assessing bone mineral content</i> (In preparation)		
Zenith Purisha, Juho Rimpeläinen, Tatiana Bubba, Maximilian März, Samuli Siltanen. <i>Automatic parameter choice for sparse regularization in X-ray tomography</i> (In preparation)			
Zenith Purisha, Marcelo Hartmann. <i>Tomographic image reconstruction with the Bayesian approach</i> (In preparation)			
Activities in specialist bodies over the last 5 years <i>(Membership without a specific role need not be mentioned)</i>	Organization	Role	Period
	<b>PPI Finlandia ry (Indonesian Student Association in Finland)</b>	Education Division (organizing seminars and workshops about research interest especially from Indonesian students in Finlandia)	2013 - 2015