

# Agniva SENGUPTA

## PERSONAL DATA

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ADDRESS: Rennes, France  
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## EDUCATION

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JULY 2012 Master of Technology in MECHANTRONICS, [IIEST, Shibpur](#), India  
*summa cum laude* | Master's Theses in *Path planning for Mobile Robots*  
Advisor: Dr. S. N. SHOME, Dr. Ranjit RAY, Prof. Subhasis BHAUMIK  
GPA: 1606/2200 | [Detailed List of Exams](#)

AUGUST 2008 Bachelor of Technology in INFORMATION TECHNOLOGY  
*summa cum laude*, West Bengal University of Technology, India  
| [Detailed List of Exams](#)

## PUBLICATION

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- Sengupta, Agniva, and E. Shafeeq. "New feature detection mechanism for extended Kalman filter based monocular SLAM with 1-point RANSAC" *Lecture Notes in Artificial Intelligence, Springer*. Mining Intelligence and Knowledge Exploration, 2015.
- Sengupta, Agniva, Ranjit Ray, and S. N. Shome. "Virtual Stretched String: An Optimal Path Planning Technique over Polygonal Obstacles" *Proceedings of Conference on Advances In Robotics*. ACM, 2013.
- Sengupta, Agniva. "Obstacle Avoidant Path Planning Using Probabilistic Genetic Algorithm With Adaptive Performance Optimization" *Recent Advancement in Mechatronics Automation. BESUS, Shibpur, Howrah : s.n., 2011*.

## PHD TOPIC & DETAILS

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The objective of my thesis is the localization and characterization of objects of unknown shape using computer vision techniques. The practical objective is to enable the achievement of robotic tasks such as the interaction between a dynamic system such a robot arm with objects of whose shape are apriori unknown.

I work in the [LAGADIC](#) research group of INRIA, Rennes. My thesis is supervised by [Eric Marchand](#) and [Alexandre Krupa](#). I defend my PhD in/around December, 2019.

**Research Interests:** Computer Vision, Structure-from-Motion, 3D reconstruction, Object Tracking, visual SLAM, non-rigid surface modelling

## TECHNICAL SKILLS

<i>Computer Vision and SFM</i>	Multiview Geometry, SFM, Visual SLAM Bundle Adjustment, ICP, EKF based MonoSLAM  WORKED ON: PTAM, LSD SLAM, ORB SLAM, OKVIS, MSCKF, IMU + LSD-SLAM/ORB-SLAM fusion with EKF, Porting multiple Sensor Fusion suits for MAVs into mobile devices MINIMIZATION TECHNIQUES: Steepest Gradient, Gauss-Newton, Weighted Gauss-Newton, Levenberg-Marquardt FUNDAMENTAL MATHS: Linear Algebras, Probability + Statistics, Lie groups & algebras of $GL(n)$ , $SL(n)$ , $SO(3)$ , $SE(3)$ , $Sim(3)$
<i>Robotics</i>	PATH PLANNING: A*, D* Lite, Field D*, IDA*, Theta *, Dijkstra's Algorithm, Visibility Graph, Virtual Stretched String  STATE SPACE ESTIMATION: Particle Filter, Kalman Filter, EKF
<i>Image Processing</i>	Sweep and 360 panoramas, Thresholding, Segmentation, Morphology, Feature Recognition, Probability Density Function, Inpainting algorithms, Computational Photography, Background/Foreground modeling
<i>Machine Learning</i>	PCA, SVD, Neural Network, CNN, Boosting and Bagging strategy, SVM, Linear and Logistic Regression, Polynomial Classifier, Decision Tree, Bayesian Classifier, Markov Chain
<i>Programming Languages</i>	C/C++, Python, MATLAB, R

## WORK EXPERIENCE

JAN 2017 TO PRESENT	PhD Student at <a href="#">INRIA, RENNES</a> , France <i>Localization and characterization of deformable objects with unknown shapes</i>
NOV 2015 TO DEC 2016	Computer Vision Research Engineer at <a href="#">WHODAT TECH PVT. LTD.</a> , Bangalore, India <i>Working on Visual SLAM, camera localization and SFM for Markerless Augmented Reality applications</i>
AUG 2014 TO NOV 2015	Senior Design Engineer at <a href="#">KRITIKAL SOLUTIONS PVT. LTD.</a> , Bangalore <i>Working for <a href="#">Continental Automotives</a> in Advanced Driver Assist Systems</i> Machine Learning and Image Processing for Sign Recognition Systems
FEB 2013 - MAY 2014	Engineer at <a href="#">TECH BLA SOLUTIONS PVT. LTD.</a> , Calcutta, India Computer Vision for mobile devices, control system for quadrotors.