Amarendra Badugu

Doctoral Candidate

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Programming

Python, R, Matlab, VB,
ImageJ/Jython scripting

Hardware

Arduino, Virtual reality

Software

FIJI, ilastik, Comsol
multiphysics, Amira,
Hyugens, Genomics/
Transcriptomics tools,
Blender, Gaming
engines (UE4, Unity)

Extra skills

Genetic algorithms,
Turing patterning,
Spatial statistics,
Cell-vertex models,
Image processing
pipelines

Microscopy

Confocal, 2-Photon,
STED, Lightsheet,
Transmission electron
microscopy

Wetlab

Model based
experimental design,
Drosophila genetics,
Clearing protocols,
Tissue decellularization

Education

2012–	**PhD (Completion: early 2018)**	IMLS, University of Zurich, Zurich

Specialization in imaging, tissue mechanics, developmental biology and *Drosophila* genetics.

2009–2012	**Master** of Science	Royal Institute of Technology, Sweden

Specialization in Computational and Systems Biology.

2002–2006	**Bachelor** of Technology	JNTU University College of Engineering (Autonomous), India

Specialization in Electronics and Communication Engineering.

Professional experience

2006–2009	**Intergraph Consulting Pvt Ltd (part of Hexagon AB)**	Hyderabad, India

Software analyst
Part of Geospatial Intelligence Production Solution (GIPS) group. Involved in development of four cartography products. Reported directly to executive manager in charge of Geospatial development, Sreenivasa Rao Majety.

Research experience

2012–	**PhD candidate in lab of Prof. Konrad Basler**	IMLS, University of Zurich, Zurich

The goal of the project was to use top-down approaches from engineering disciplines to generate a series of tissue models in 3D using experimental data from epithelial organs. The roles of the project were experimental pipeline design, biological experiments, image/data analysis and insilico model design.

2011–2012	**Lab of Prof. Dagmar Iber**	D-BSSE, ETHZ, Switzerland

Research assistant
Developed in-silico models of digit patterning during limb development in mouse.

2011	**Lab of Prof. Jotun Hein**	Department of Statistics, University of Oxford

Summer school student
Developed a single and multi structure genetic algorithm for Inverse folding of RNA.

2010	**Lab of Prof. Ingemar Ernberg**	MTC, Karolinska Institutet, Sweden

Bioinformatician
Predicted ARID3a protein binding sites on Epstein Barr virus (EBV) genome in a summer and semester project with Prof. Erik Aurell, KTH and Prof. Ingemar Ernberg, KI.

2005–2006	**Lab of Prof. K Padma Raju**	JNTU University College of Engineering (Autonomous), India

Bachelor thesis
Shielded electromagnetic radiation using various metals.

Publications

1. Badugu A, Käch A, Basler K.
A basal-to-apical cytoplasmic flow precedes mitosis during interkinetic nuclear migration.
(To be submitted)
2. Badugu A, Käch A, Brunner E, Basler K.
Patterns in basement membrane determine tissue mechanics in wing imaginal disc. (Preparation)
3. Badugu A, Kraemer C, Germann P, Menshykau D, Iber D.
Digit patterning during limb development as a result of the BMP-receptor interaction. Sci. Rep. 2012;2:991.
4. Badugu A.
Mathematical Modelling of Digit Patterning in Mouse Limb Development. Master of Science Thesis, KTH, Sweden.
5. Lyngsø R, Anderson J WJ, Sizikova E, Badugu A, Hyland T, Hein J.
Frnakenstein: multiple target inverse RNA folding. BMC Bioinformatics. 2012;13:260.

Unconventional projects

2016–17	**Virtual reality(VR) exploration of *drosophila* organs and tumours**	IMLS, UZH

Exploration of 3 Dimensional geometries with first person view in VR. Presented with Oculus Rift DK2. Demo walkthroughs : abadugu.com/arcbio.html

2015–17	**Growing mammalian epithelial cells on *drosophila* wing disc basement membrane scaffolds.**	Unibas, UZH

Collaboration with Nihan Kilinc from Unibas.

2015	**Mobile app "Rockmylight" at hackathon HackZurich**	Zurich

Created a mobile app with Yauhen Yakimovich and Vardan Andriasyan that generates patterns of color/intensity on the smart phone screen following the beat in a music sample. Phone-server communication was used to synchronize large number of phones in a hall. One of the final 25 teams who made a live presentation on stage.

Notable achievements

2016	**NVIDIA Developer GPU Grant Program**	IMLS, UZH

Project on large scale tissue rendering in VR received a Pascal GPU.

2014	**Travel grant**	Zurich

From Julius Klaus-Stiftung for Genetik und Sozialanthropologie for attending Epithelia: The Building Blocks of Multicellularity" at EMBL heidelberg.

2013	**Intel Galileo grant program**	Zurich

Received galileo microcontroller boards for teaching.

2008	**Pat on the Back Award**	Intergraph, Hyderabad

For outstanding work done towards the first release of feature cartographer.

2006	**Best business plan**	Andhra pradesh, India

Zeitgeist-2k6, a national level technical symposium.

2002	**EAMCET examination for university entrance**	Andhra pradesh, India

Rank of 633 out of 1,49,850 engineering track examinees.

2001, 2000	**State level mathematics Olympiad**	Andhra pradesh, India

Rank of 3 (2001) and 2 (2000).

Teaching and organizational activities.

2015–	**EIDIAs/Table of 10**	Zurich City

Co-organiser of a popular meetup group (1020 members) in Zurich for discussion on a diverse set of topics in science, philosophy and sociology. Organized topics on science and technology outreach.

2012–	**Design of image analysis plugins and pipelines**	UZH, ETH and Unibas

Designed plugins and pipelines in FIJI and Matlab of varying requirements for different people.

2015–16	**Morphobiology forum**	IMLS, UZH

Organised it as part of an effort to facilitate communication between physicists, engineers and biologists.

2012–	**Collaborations**	IMLS, UZH

With various technology, microscopy, wetlab and modelling groups to bring in expertise for PhD project.

2015	**Supervision**	IMLS, UZH

Project Supervision of two bachelors students on actin-cytoskeleton and hippo signaling.

2013–14	**Course Programming in Biology, BIO 317**	UZH

Teaching assistant. Created a module with Galileo microcontroller boards received from Intel to introduce controlling hardware with python to biology students.

2009	**Technology transfer**	Intergraph, Hyderabad

Produced extensive documentation, provided training and transfer to internal employees.

2008–09	**Training and supervision**	Intergraph, Hyderabad

Trained 4 new employees on product development in the GIPS team. Supervised 2 employees during feature cartographer product development.