

CURRICULUM VITAE

DIGAMBAR PAWAR
Ph.D BITS Pilani,
Associate Professor

School of Computer & Information Sciences,
University of Hyderabad, Gachibowli, Hyderabad-500046
dpr@uohyd.ac.in

Research Areas

- Digital Forensics
- Cloud Computing and allied areas
- Information Security

Profile

- A total of 19 Years of experience – 13 years in teaching (B.Tech & M.Tech level), 6 years in Research and Development in a Central Government organization
- Have 16 international publications in journals and book chapters (8 as first author and remaining as co-author)
- At C-DAC, contributed in the development of Cyber Forensic tools like CyberCheck (Forensic Disk analysis tool), F-DaC (Forensic Data Carving tool), FIRT (Forensic Image Recovery tool), etc. All these tools are used by Law Enforcement Agencies, Govt. India
- Served as a faculty in conducting “Courses on Cyber Forensics” to Law Enforcement officers (CBI, IB, Navy, NIA, NPA and various state police services)
- Participated in many conferences and workshops in India and abroad in the areas of Digital forensics and cloud computing
- Delivered guest lectures in many Engineering colleges on the topics – Digital forensics, cloud computing and allied areas, Data forensics in cloud, etc.
- Reviewer for International conferences and journals
- Reviewer for a no. of Ph.D. theses evaluation
- Advisory committee member/ interview panel member for various Institutions/Organizations
- Recently worked as Co-Investigator for the project "Design and Development of Digital Forensic Tools for Cloud IaaS", funded by Dept. of Information Technology, Govt. of India

Professional Experience (above 2 Yrs.)

Designation	Associate Professor	Lecturer/Asst. Prof	Scientist. B
Organization	University of Hyderabad	BITS Pilani Hyderabad Campus	C-DAC, Trivandrum
Date of Joining	01.03.2011	14.03.2011	16.11.2005
Date of Leaving	Till date	30.11.2016	11.03.2011

Academic Background	
Degree / Certificate	Details
Ph.D	In the area of Digital forensics/Cloud Forensics, BITS Pilani, during 2011-2016
M.Tech	In Computer Science, NIT Warangal, during 2001-2003
B.Tech	In Computer Science, SRKR, Andhra University, during 1997-2001

Sponsored Projects Undertaken	
Sept 2014 to Sept 2016	<p>Location: BITS Pilani, Hyderabad campus, 500078, Telangana, India</p> <p>Project: Cloud Investigator (Design and Development of Digital Forensic Tools for Cloud IaaS)</p> <p>Team Size: 6</p> <p>Role (Co-Investigator): Architect for Digital Forensics in cloud IaaS.</p> <p>Cloud testbed: OpenStack (icehouse)</p> <p>Description: Cloud forensics is a mechanism that provides the requisite tools for investigation and analysis of cloud security threats. Due to the decentralized nature of data processing in cloud, traditional approaches to evidence collection and recovery are not practical. The aim of this project was to design a generic digital forensic framework for the cloud crime investigation by identifying the challenges and requirements of forensics in the virtualized environment of cloud computing, address the issues of dead/live forensic analysis within/outside the virtual machine that runs in a cloud environment, and to design a digital forensic triage using parallel processing framework to examine and partially analyze the virtual machine data to speed up the investigation of the cloud crime. To analyze the evidence within the virtual machine, we designed various methods of examining the file system metadata, the registry file content, and the physical memory content. For the evidence which is outside a virtual machine (cloud logs), various methods of log data segregation and collection have been devised.</p>
Nov 2005 to Mar 2011	<p>Location: Center for Development of Advanced Computing (CDAC), Trivandrum – 695 033, Kerala, India</p> <p>Project: CyberCheck (Digital forensic tool)</p> <p>Team Size: 15</p> <p>Module: 1</p> <p>Role (Module Leader): Design and Development of CyberScript module.</p> <p>Programming Language: VC++, MFC.</p> <p>Description:</p> <p>CyberCheck: Cyber Forensics tool for data recovery and analysis. It is windows based application which allows a user to analyse the hard disk content including deleted files, contents in the slack and swap areas</p> <p>CyberScript:</p> <p>Scripting is a programming facility, which can be effectively used for performing a batch search process in an evidence file to automate the analysis process. CyberCheck should provide this facility so that analyzing officers can plan the analysis in advance and get it done without much user interaction. The functionality of the module includes,</p> <ul style="list-style-type: none"> ✓ Searching for the files with given file attributes. ✓ Searching for keywords within selected files/folders, entire evidence, or selected list (output of already executed script). ✓ Searching for a string that matches a given regular expression. ✓ Searching for IP addresses, Web addresses E-mail addresses, valid credit card numbers, etc. <p>It also provides a very good GUI, Syntax highlighting facility to enter the script in correct format. Using the GUI facility user can write, save and open the already existing script.</p> <p>Module: 2</p> <p>Team Size: 2</p> <p>Role (Module Leader): Design and Development of in-place (Zero storage) carving of data.</p> <p>Programming Language: VC++, MFC.</p> <p>Description: Module for in-place carving of data provides a facility for extracting complete or</p>

	<p>fragments of different types of files. Usually traditional cyber forensic tools does not extract files from areas like unallocated clusters, lost clusters and slack spaces (especially disk slack). Using this module, investigator can recover known files from all these areas of storage media.</p> <p>Project: F-DAC (Forensic Data Carving Tool) Team Size: 2 Role (Project Leader & Architect): Design and Development of F-DAC. Programming Language: VC++, MFC. Description: F-DAC is a forensic tool used for file carving. File carving is the process of recovering files from a disk without the help of a file system. Using Header/Footer carving method for this purpose. Header/Footer is a method of carving files from a binary image using a distinct header (start of file marker) and footer (end of file marker).</p> <p>Project: Data Extractor Team Size: 1 Role: (Project Leader & Architect): Design and Development of Data Extractor. Programming Language: VC++, MFC. Description: Data Extractor is a database application, using which user can filter database content using SQL query. GUI is provided to the user to write a query and extract the database content based on the written query.</p> <p>Project: FIRT (Forensic Image Recovery tool) based on skin tone filtering technique. Team Size: 2 Role (Project Leader & Architect): Design and Development of FIRT. Programming Language: VC++, MFC. Description: FIRT is a forensic tool used to retrieve all picture files from a digital media/image. Files are retrieved using distinct headers of the files. We use file system information to retrieve undeleted files and data carving methods to retrieve deleted files. This tool uses skin tone detection techniques to identify a pornography picture file.</p>
<p>April 2005 to Nov 2005</p>	<p>Project Engineer, Center for Development of Advanced Computing (CDAC), Noida – 695 033, Uttar Pradesh , India Project: Design and Development of “Integrated Security Device for Tracking and Data Acquisition” Programming Language: VB .Net. Team Size: 10 Role: Design and Development of GUI on the server side for serial communication. Description: The objective of the project is to integrate the RFID technology with the GSM, GPS and the RF Modem to achieve precise tracking and data acquisition. GSM is used for long range communication via its data services and SMS. GPS is used to get the location. RF Modem is used for local communication within 200 meters.</p>

Papers in refereed journals/Conference proceedings	
SL. No.	Details
1	Sanda, Pranitha, Digambar Pawar , and V. Radha. "Blockchain-based tamper-proof and transparent investigation model for cloud VMs" The Journal of Supercomputing (2022): 1-29.
2	Sanda, Pranitha, Digambar Pawar , and V. Radha. "An insight into cloud forensic readiness by leading cloud service providers: a survey" Computing (2022): 1-26.
3	Gowada, Raghavendra, and Digambar Pawar . "Porn Image Forensics: Image Classification, Forgery Detection and Localization" International Conference on Computing in Engineering & Technology (pp. 359-371). Springer, Singapore, 2022.
4	Sanda, Pranitha, Digambar Pawar , and V. Radha. "VM Anti-forensics: Detecting File Wiping Using

	File System Journals." International Conference on Computing in Engineering & Technology (pp. 497-508). Springer, Singapore, 2022.
5	Digambar Pawar , and Mayank Gajpal. "Image Forensic Tool (IFT): Image Retrieval, Tampering Detection, and Classification." International Journal of Digital Crime and Forensics (IJDCF) 13.6 (2021): 1-15.
6	Sulthana, Tasleem, and Digambar Pawar . "Digital Forensic Investigator for Cloud Computing Environment." Computer Communication, Networking and IoT. Springer, Singapore, 2021. 53-61.
7	Gowada, Raghavendra, Digambar Pawar , and Satish Reddy Tetali. "Multimedia Forensics-An approach to detect and analyze Human faces in multimedia files." 2019 Fifth International Conference on Image Information Processing (ICIIP), (pp. 274-279). IEEE, 2019.
8	Digambar P. , and Dr. Geethakumari, "Digital Forensic Architecture for Cloud Computing Systems: Methods of Evidence Identification, Segregation, Collection and Partial Analysis", Third International Conference on INformation systems Design and Intelligent Applications - INDIA-2016, Advances in Intelligent Systems and Computing (AISC) series, Vol. 433, pp 213-225 (Springer)
9	Digambar P. , Saibharath, Dr. Geethakumari, "Real-time digital forensic triaging for cloud data analysis using MapReduce on Hadoop framework", International Journal of Electronic Security and Digital Forensics, Inderscience Publishers, Vol. 7, Issue No. 2, pp. 119-133, 2015
10	Meera G, B K S P Kumar Raju, Digambar P. , and G Geethakumari, "A strategy for enabling forensic investigation in cloud IaaS", Proceedings of the 2015 IEEE International Conference on Electrical, Computer and Communication Technologies,– IEEE ICECCT 2015, March 05-07, 2015, India, Proceedings in IEEE Explore
11	Digambar P. , and Dr.Geethakumari, "A Heuristic Model for Performing Digital Forensics in Cloud Computing Environment", International Symposium on Security in Computing and Communications (SSCC-2014), Communications in Computer and Information Science (CCIS), Volume 467, 2014, pp 341-352, (Springer)
12	Shanti Swaroop Moharana, Rajadeepan D. Ramesh, and Digambar P. , "Analysis of load balancers in cloud computing", International Journal of Computer Science and Engineering (IJCSE), Vol. 2, Issue 2, pp. 101-108, May 2013
13	Digambar P. , and G Geethakumari, "A Novel approach to Detect Cloud Virtual Machines hidden using Alternate Data Streams", Proceedings of the IEEE International Multi Conference on Automation, Computing, Control, Communication and Compressed Sensing, iMac4s-2013, March 22-23, Kottayam, India, 2013, pp. 835-839
14	Digambar P. , and G Geethakumari, "Digital Evidence Detection in Virtual Environment for Cloud Computing", Proceedings of the ACM International Conference on Security of Internet of Things, SecurIT'12, August 17-19, Kollam, India, 2012, pp.102-106
15	Digambar P. , Divya S. Vidyadharan, Thomas K.L, "Digital image evidence detection based on skin tone filtering technique", in International conference on advances in computing and communications, ACC 2011, Part I, CCIS 190, PP. 544-551, 2011(Springer)
16	Digambar P. , V.K. Bhadran, "Forensic Data Carving", ICDF2C 2010, LNICST 53, pp. 137-148, 2010