



**Laxmi Charitable Trust's**  
**Sheth L.U.J. College of Arts & Sir M.V. College of Science & Commerce**  
**Dr. S. Radhakrishnan Marg, Andheri (East), Mumbai 400 069.**

**Criteria No. : 3 - Research, Innovations and Extension**

**Metric No. : 3.5 Collaboration**

**Sub Metric No. : 3.5.1 Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.**

List of year wise activities and exchange should be provided.

**INDEX**

<b>Sr. No.</b>	<b>Document Links</b>	<b>Page No.</b>
<b>1.</b>	<b>A.Y. 2023-2024</b>	<b>3 - 11</b>
<b>2.</b>	<b>A.Y. 2022-2023</b>	<b>12 - 19</b>
<b>5.</b>	<b>A.Y. 2019-2020</b>	<b>20 - 22</b>



Laxmi Charitable Trust's  
**Sheth L.U.J. College of Arts & Sir M.V. College of Science & Commerce**  
Dr. S. Radhakrishnan Marg, Andheri (East), Mumbai 400 069.

**3.5.1: Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.**

List of year wise activities and exchange should be provided

Sr. No.	Year	Name of the Collaborating agency
1	2024	Support Hives Technology LLP
2	2024	Silverlink Technologies Pvt. Ltd.
3	2024	(Rentkar) Quantam Rental Solutions Pvt. Ltd.
4	2023	Silverlink Technologies Pvt. Ltd.
5	2023	Webengage Company
6	2023	RockTheIT
7	2018 to 2023	Support Hives Technology LLP
8	2018	Research Paper - BREAST CANCER DETECTION USING WBCD (Research Paper Publication)

(2)





**Laxmi Charitable Trust's**  
**Sheth L.U.J. College of Arts & Sir M.V. College of Science & Commerce**  
**Dr. S. Radhakrishnan Marg, Andheri (East), Mumbai 400 069.**

**Sub Metric No. :** 3.5.1 Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.

List of year wise activities and exchange should be provided.

**A.Y. 2023-2024**

<b>Sr. No.</b>	<b>Documents</b>
<b>1.</b>	<b>Support Hives Technology LLP</b>
<b>2.</b>	<b>Silverlink Technologies Pvt. Ltd.</b>
<b>3</b>	<b>(Rentkar) Quantam Rental Solutions Pvt. Ltd.</b>

## Support Hives technology LLP – DevOps

### Company Profile

"Support Hives is a one stop-shop for all your online needs, right from Domain name registration, transfers, Web & App design, development, hosting, technical support, server & infra management, data centers, networking, managed services, digital marketing, influencer marketing, cybersecurity, cloud services management, and a lot more!"

Office Location – Malad (West), Mumbai.

Company website: [www.supporthives.com](http://www.supporthives.com)

### Job Description

We are looking for a skilled DevOps Engineer, To strengthen further our team, to work with the leading Infrastructure & SaaS Platform. S/he must have experience in infra operational activities. S/he has sharp and tenacious troubleshooting skills with ability to identify and fix issues in Linux & Windows.

### Your Role And Responsibilities

- Implement security policies
- Ability to estimate usage cost and identify operation cost mechanisms
- Working on Monitoring /Scripting
- Installation and configuration of Linux for new build environment.
- Good team player with willingness to learn and drive to achieve.
- Setting up the Production, Staging and Development Environment on Cloud server
- Planning and execution of patching and cluster switching of machines
- Architect the monitoring system for the System Application and Testing environment
- EC2 instance creation and deployment.
- Configuration of VPC, Storage management, Persistent storage.
- Applied patches on all Linux Boxes from common repository.
- DNS, DHCP Server Configuration and Administration.
- Provide timely solution to clients and quickly understand and resolve critical application operational issues.
- Disk Management, LVM (Logical Volume, Volume Group), File Systems, SoftRAID Mdadm
- Managing of partitions and FS using Logical Volume Manager FDISK & GPT

### Required Technical And Professional Expertise

- Expertise in the Cloud platforms or different OS like macOS and multiple linux flavours like Ubuntu, CentOS
- Expertise in the public cloud operations and managing services (k8s, SQL server, GitHub)
- Expertise in AWS Compute, Storage, Networking, Databases, Security, Management and Developer Tools



**Preferred Technical And Professional Experience**

- MS Azure platform
- MS Azure stack (Data Factory, Synapse, SQL, Gen2, Blob)
- GitHub, Python, Bash shell script, NodeJS
- Knowledge of Apache Tomcat and nginx server

**Requirements:**

- Master's or Bachelor's degree preferable in related field.
- Proficiency in English
- Multi-tasking and time-management skills, with the ability to prioritize tasks.
- Ability to work in a fast-paced, high-pressure environment. Work in agile environment.
- Hands on experience on shell scripting
- Hands on experience on basic SQL queries
- Candidate should be keen to learn and work on multiple tech stack on the Linux / Windows systems and work independently.
- Ability to manage the PROD applications and infrastructure.

**Key Requirement: Azure & AWS (Certified)  
Willing to work in shifts.**

**Experience - 3+ years**



## Support Hives technology LLP – System Administrators

### Company Profile

"Support Hives is a one stop-shop for all your online needs, right from Domain name registration, transfers, Web & App design, development, hosting, technical support, server & infra management, data centers, networking, managed services, digital marketing, influencer marketing, cybersecurity, cloud services management, and a lot more!"

Office Location – Malad (West), Mumbai.

Company website: [www.supporthives.com](http://www.supporthives.com)

### Job Description

We are looking for a skilled System Administrator, To strengthen further our team, to work with the leading Infrastructure & SaaS Platform. S/he must have experience in infra operational activities. S/he has sharp and tenacious troubleshooting skills with ability to identify and fix issues in Linux & Windows.

### Your Role And Responsibilities

- Implement security policies
- Ability to estimate usage cost and identify operation cost mechanisms
- Working on Monitoring /Scripting
- Installation and configuration of Linux for new build environment.
- Good team player with willingness to learn and drive to achieve.
- Setting up the Production, Staging and Development Environment on Cloud server
- Planning and execution of patching and cluster switching of machines
- Architect the monitoring system for the System Application and Testing environment
- EC2 instance creation and deployment.
- Configuration of VPC, Storage management, Persistent storage.
- Applied patches on all Linux Boxes from common repository.
- DNS, DHCP Server Configuration and Administration.
- Provide timely solution to clients and quickly understand and resolve critical application operational issues.
- Disk Management, LVM (Logical Volume, Volume Group), File Systems, SoftRAID Mdadm
- Managing of partitions and FS using Logical Volume Manager FDISK & GPT

### Required Technical And Professional Expertise

- Expertise in the Cloud platforms or different OS like macOS and multiple linux flavours like Ubuntu, CentOS
- Expertise in the public cloud operations and managing services (k8s, SQL server, GitHub)
- Expertise in AWS Compute, Storage, Networking, Databases, Security, Management and Developer Tools



**Preferred Technical And Professional Experience**

- MS Azure platform
- MS Azure stack (Data Factory, Synapse, SQL, Gen2, Blob)
- GitHub, Python, Bash shell script, NodeJS
- Knowledge of Apache Tomcat and nginx server

**Requirements:**

- Master's or Bachelor's degree preferable in related field.
- Proficiency in English
- Multi-tasking and time-management skills, with the ability to prioritize tasks.
- Ability to work in a fast-paced, high-pressure environment. Work in agile environment.
- Hands on experience on shell scripting
- Hands on experience on basic SQL queries
- Candidate should be keen to learn and work on multiple tech stack on the Linux / Windows systems and work independently.
- Ability to manage the PROD applications and infrastructure.

**Key Requirement: Willing to work in shifts.**

**Experience – 1+ years**



A.Y. 2022-23  
A.Y. 2023-24

## Company Profile: Silverlink Technologies

Silverlink Technologies is an ISO 9001:2008 certified global Consulting firm Established in 2003 and is one of the fastest-growing end-to-end information technology staffing services, RPO, and solutions companies globally. As a 40 million dollar IT company & with global offices across 16 countries (NORTH AMERICA, EUROPE, AFRICA, MIDDLE EAST, ASIA PACIFIC, AUSTRALIA & NEW ZEALAND), Silverlink's client-centric business model, commitment to service excellence and Global Delivery Model enables its global and leading mid-market clients to deliver successfully in an increasingly competitive marketplace.

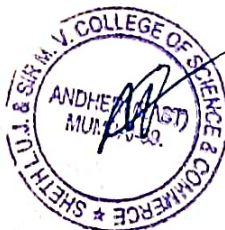
With a global presence across 16 countries, Silverlink Technologies provides value-added onsite, offsite, and offshore technology services and solutions to premier corporations locally and internationally.

United States of America	New York, Delaware, Texas, California
Europe	United Kingdom, Switzerland, Netherlands, Belgium, Germany (liaising offices in Poland, Romania, Hungary, and Spain)
Africa	Johannesburg South Africa
Middle East	Dubai, Sharjah & (liaising offices Oman, Riyadh)
India	Mumbai, Pune, Nashik and Cochin
South East Asia	Singapore, Malaysia, Australia & (liaising offices Japan, China, Indonesia, Philippines & Thailand)

We are currently expanding and are looking out for FRESHERS who are keen and want to make a career in the international arena by supporting the APAC, UK-EU, USA, and Canada regions.

### Job Requirements:

- Decent Knowledge of IT skills
- Should have good communication skills
- Should have the ability to deliver results under pressure
- Making decision very proactively
- Passionate about exploring the opportunities in International Arena
- Working in a very aggressive style
- Excellent Team skills
- Down to Earth attitude



### Job Roles and Responsibilities:

- A technical recruiter is responsible for all aspects of the sourcing and hiring of IT professionals to fill technical positions.
- Will work to identify and fill job openings, interview candidates, and keep records of applications.
- Should be responsible for sourcing, screening and providing a shortlist of qualified candidates for various technical roles.
- Source potential candidates on niche platforms.
- Perform pre-screening calls to analyze applicants' abilities
- Working on IT requirements for top Clients
- Keep up-to-date with new technologies
- Promote client's/Company's reputation as a great place to work
- Craft and send personalized recruiting emails with current job openings to passive candidates
- Parse specialized skills and qualifications to screen IT resumes

**Please note:** Training will be provided to the freshers on the above-mentioned roles and responsibilities.

**Please find the below Qualifications,**

**Degree Qualification :** BSC (CS), BSC (IT), BCA, BMS/BBA.

1. **Position :** IT Technical Recruiter –Trainee
2. **Salary:** 2,54,400 gross per annum (21,200/- In-hand Per Month)
3. **Timings :**

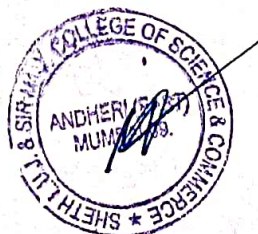
**India (Domestic) :** 9.30am to 6.30pm (Monday to Friday)

**Apac (Australia) :** 6:30am to 3:30 pm (Monday to Friday)

**UK :** 1:00 pm to 10.30 pm (Monday to Friday)

(Fixed shift for any one of the above mentioned departments. Shift would be finalized in the last round by the employer)

4. (Please find the Interview procedure below,)



**Interview rounds:**

1) Personal Interview/Aptitude Test

(All the interview rounds would be conducted in the Mumbai office)

2) Technical round

3) Communication/HR round

4) MR round

**5. Benefits :**

1. Yearly Bonus
2. Incentives
3. Bonus appraisal in trainee period
4. Full salary in Covid situation i.e. No deductions in terms of Covid.
5. Weekends off
6. Training will be provided.
7. You will get a chance to work with reputed IT International Companies.
8. Exposure to International markets like Australia, UK, US, etc.

**6. LONG-TERM EMPLOYMENT :**

1. A Service Agreement of 2 years

**Please Note :** Work from Office available. Training would be provided in the Andheri (E) office.

**Total Vacancies :** 30 +

Register through this given link : <https://forms.gle/NoGdtg1CzzV2qx148>

**Thanks & Regards,**  
Silverlink Technologies



**InternShip Available for :- MERN Stack Development****At :- RentKar : Switch to Share****Job Description :-**

1. Developing and implementing highly responsive user interface components using react concepts
2. Writing application interface codes using JavaScript following react.js workflows
3. Design and implement MongoDB databases based on application requirements
4. Write and optimize MongoDB queries for efficient data retrieval
5. Use version control systems (e.g., Git) for code management and collaboration
6. Maintain comprehensive documentation for database schemas, queries, and API endpoints
7. Create and manage database schemas and collections

**Requirements:** Knowledge of state management libraries (e.g., Redux toolkit).**Skill(s) required:**

Amazon Web Services (AWS)

Express.js

JavaScript

MEAN/MERN Stack

MongoDB

Node.js

ReactJS

Redux

**If Interested Mail You CV to:-**[hr.rentkar@gmail.com](mailto:hr.rentkar@gmail.com)CC :- [rahulpusal3@gmail.com](mailto:rahulpusal3@gmail.com)



**Laxmi Charitable Trust's**  
**Sheth L.U.J. College of Arts & Sir M.V. College of Science & Commerce**  
**Dr. S. Radhakrishnan Marg, Andheri (East), Mumbai 400 069.**

**Sub Metric No. :** 3.5.1 Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.

List of year wise activities and exchange should be provided.

**A.Y. 2022-2023**

<b>Sr. No.</b>	<b>Documents</b>
<b>1.</b>	<b>Support Hives Technology LLP</b>
<b>2.</b>	<b>Silverlink Technologies Pvt. Ltd.</b>
<b>3</b>	<b>Webengage Company</b>
<b>4</b>	<b>RockTheIT</b>

## Support Hives technology LLP – Front End Developer - Intern

### Company Profile

"Support Hives is a one stop-shop for all your online needs, right Domain name registration, transfers, Web & App design, development, hosting, technical support, server & infra management, data centers, networking, managed services, digital marketing, influencer marketing, cybersecurity, cloud services management, and a lot more!"

Office Location – Malad (West), Mumbai.

Company website: [www.supporthives.com](http://www.supporthives.com)

### Job Description

We are looking for a smart Frontend and UI Developers Interns, To strengthen further our team, to work with the leading Infrastructure & E-Commerce Platforms. S/he must be skilled in Frontend development and hands on for various UI/UX frameworks. S/he has sharp and tenacious troubleshooting skills with ability to identify and fix issues, responsiveness of the UI, with good understanding of the development cycle.

### Your Role and Responsibilities

- Can Develop new user-facing interfaces
- Ensuring UI design is optimized for desktops & smartphones
- Optimize application for maximum speed and scalability
- Assure that all user input is validated before submitting to the back-end
- Collaborate with other team members and stakeholders
- Improving and enhancing websites after they have been created
- Building the Bootstrap front-end framework, which includes a comprehensive collection of HTML, CSS, and JavaScript tools.
- The developer must have fluency in front-end frameworks to develop the Bootstrap framework 5 & 6.
- Knowledge of client-side scripting and JavaScript frameworks, such as jQuery.
- Understanding of web markup, including HTML5 and CSS3.

### Required Technical and Professional Expertise

- Proficient understanding of web markup, including HTML5, CSS3, BOOTSTRAP 5&6.
- Proficient understanding of client-side scripting and JavaScript frameworks, including jQuery
- Candidate who are applying to this position, should be comfortable in Work from Office
- Good understanding of cross-browser compatibility issues and ways to work around such issues

### Requirements:

- Proficiency in English
- Multi-tasking and time-management skills, with the ability to prioritize tasks.
- Ability to work in a fast-paced, high-pressure environment.
- Knowledge of Figma is as add-on



A.Y. 2022-23  
A.Y. 2023-24

## Company Profile: Silverlink Technologies

Silverlink Technologies is an ISO 9001:2008 certified global Consulting firm Established in 2003 and is one of the fastest-growing end-to-end information technology staffing services, RPO, and solutions companies globally. As a 40 million dollar IT company & with global offices across 16 countries (NORTH AMERICA, EUROPE, AFRICA, MIDDLE EAST, ASIA PACIFIC, AUSTRALIA & NEW ZEALAND), Silverlink's client-centric business model, commitment to service excellence and Global Delivery Model enables its global and leading mid-market clients to deliver successfully in an increasingly competitive marketplace.

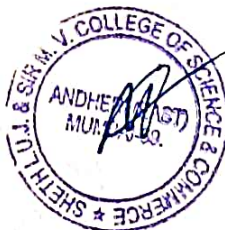
With a global presence across 16 countries, Silverlink Technologies provides value-added onsite, offsite, and offshore technology services and solutions to premier corporations locally and internationally.

United States of America	New York, Delaware, Texas, California
Europe	United Kingdom, Switzerland, Netherlands, Belgium, Germany (liaising offices in Poland, Romania, Hungary, and Spain)
Africa	Johannesburg South Africa
Middle East	Dubai, Sharjah & (liaising offices Oman, Riyadh)
India	Mumbai, Pune, Nashik and Cochin
South East Asia	Singapore, Malaysia, Australia & (liaising offices Japan, China, Indonesia, Philippines & Thailand)

We are currently expanding and are looking out for FRESHERS who are keen and want to make a career in the international arena by supporting the APAC, UK-EU, USA, and Canada regions.

### Job Requirements:

- Decent Knowledge of IT skills
- Should have good communication skills
- Should have the ability to deliver results under pressure
- Making decision very proactively
- Passionate about exploring the opportunities in International Arena
- Working in a very aggressive style
- Excellent Team skills
- Down to Earth attitude



### Job Roles and Responsibilities:

- A technical recruiter is responsible for all aspects of the sourcing and hiring of IT professionals to fill technical positions.
- Will work to identify and fill job openings, interview candidates, and keep records of applications.
- Should be responsible for sourcing, screening and providing a shortlist of qualified candidates for various technical roles.
- Source potential candidates on niche platforms.
- Perform pre-screening calls to analyze applicants' abilities
- Working on IT requirements for top Clients
- Keep up-to-date with new technologies
- Promote client's/Company's reputation as a great place to work
- Craft and send personalized recruiting emails with current job openings to passive candidates
- Parse specialized skills and qualifications to screen IT resumes

**Please note:** Training will be provided to the freshers on the above-mentioned roles and responsibilities.

**Please find the below Qualifications,**

**Degree Qualification :** BSC (CS), BSC (IT), BCA, BMS/BBA.

1. **Position :** IT Technical Recruiter –Trainee
2. **Salary:** 2,54,400 gross per annum (21,200/- In-hand Per Month)
3. **Timings :**

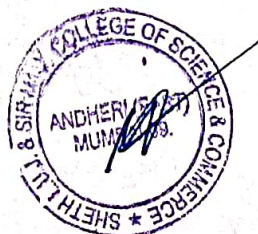
**India (Domestic) :** 9.30am to 6.30pm (Monday to Friday)

**Apac (Australia) :** 6:30am to 3:30 pm (Monday to Friday)

**UK :** 1:00 pm to 10.30 pm (Monday to Friday)

(Fixed shift for any one of the above mentioned departments. Shift would be finalized in the last round by the employer)

4. (Please find the Interview procedure below,)



**Interview rounds:**

1) Personal Interview/Aptitude Test

(All the interview rounds would be conducted in the Mumbai office)

2) Technical round

3) Communication/HR round

4) MR round

**5. Benefits :**

1. Yearly Bonus
2. Incentives
3. Bonus appraisal in trainee period
4. Full salary in Covid situation i.e. No deductions in terms of Covid.
5. Weekends off
6. Training will be provided.
7. You will get a chance to work with reputed IT International Companies.
8. Exposure to International markets like Australia, UK, US, etc.

**6. LONG-TERM EMPLOYMENT :**

1. A Service Agreement of 2 years

**Please Note :** Work from Office available. Training would be provided in the Andheri (E) office.

**Total Vacancies :** 30 +

Register through this given link : <https://forms.gle/NoGdtg1CzzV2qx148>

**Thanks & Regards,**  
Silverlink Technologies



## Product Support Engineer

Mumbai, Gurgaon, Bengaluru, Customer Success & Onboarding

### JOB DESCRIPTION

#### About us:

WebEngage is a customer data platform and marketing automation suite that makes user engagement and retention simplified and highly effective for consumer tech enterprises and SMBs. One of the hottest global SaaS companies, we've been recognized by G2 as a **Marketing Automation Leader in Asia 2021**.

The platform helps brands drive more revenue from their existing customers and anonymous users through highly contextual, hyper-personalized engagement campaigns across 10 communication channels.

We are headquartered in Mumbai, India, and have offices in Delhi, Bangalore, São Paulo, and Dubai. We work with thousands of **brands worldwide**, across industries like E-Commerce, Edtech, Fintech, Foodtech, Media & Publications, Gaming, BFSI, Healthcare, and Online Retail.

Learn more about us at [www.webengage.com](http://www.webengage.com)

You will have the opportunity to:

- Be a part of an elite Technical Support team
- Build partnerships and work with some of the biggest enterprise accounts across different domains like e-commerce, travel, insurance, banks, telecom etc
- Core markets include US, Europe and SE Asia.

#### Life at WebEngage:

- We take transparency very seriously. Along with a full view of team goals, get a top-level view across the board with our monthly & quarterly town hall meetings.
- A highly inclusive work culture that promotes a relaxed, creative and productive environment.
- Practice autonomy, open communication, growth opportunities, while maintaining a perfect work-life balance
- Go on company-sponsored offsites, once a year and blow off steam with your work buddies! (Post Pandemic)

#### Perks & Benefits:

- Learning is a way of life. Unlock your full potential backed with cutting-edge tools and mentorship (Macbook for Engagers!)
- Get the best in class medical insurance (with Covid Care facilities), programs for taking care of your mental health, and a Contemporary Leave Policy (beyond sick leaves)

#### Explore more here:

<https://youtu.be/Y0HjfyMjUpq>

<https://www.linkedin.com/company/webengage>

<https://twitter.com/WebEngage?s=09>

Think you fit the bill? Come along, let's redefine the future of Marketing Automation!

External Skills And Expertise

#### Job Responsibilities:

- Provide enterprise grade support to our clients over email and phone
- Address core technical queries related to the product
- Troubleshoot bugs faced by our clients. This typically involves working with REST APIs, HTML/CSS and Javascript
- Perform cause analysis of customer issues via in-depth research and analysis using information from product logs and other databases
- Collaborate with Engineering and Data Analytics to help solve customer issues and provide reports
- Ensure speedy resolution of issues while maintaining high customer satisfaction

#### EXPERTISE AND QUALIFICATIONS

- BE/ BTech or BSc in the field of IT/Computer Science/ Electronics/Electronics and Telecommunication
- Fresher or upto 18 months of work experience in a client facing role (Preferably B2B SaaS)
- Hands on experience with HTML/CSS and Javascript
- Excellent written and verbal communication skills
- Ability to explain complex concepts through clear and accurate writing
- People skills and having the gift of the gab to handle tricky situations
- Ability to complete large volumes of work quickly and independently with a high level of drive, initiative and self-motivation
- Comfortable working in a 24x7 rotational shift environment



## Job Title: Web Design Course Administrator Internship

### Job Description:

Company: RockTheIT

Duration: November 2022 - April 2023 (6 months)

Location: MVLU College

### About RockTheIT:

RockTheIT is a leading provider of e-learning courses specializing in web design. We offer comprehensive online training programs to empower individuals with the skills and knowledge needed to succeed in the digital world.

### Job Summary:

We are seeking a dynamic and experienced individual to join our team as a Web Design Course Administrator. The successful candidate will be responsible for managing our e-learning courses, ensuring seamless delivery of content, and providing exceptional support to our users.

### Key Responsibilities:

- **Course Management:** Oversee the administration and management of our web design courses, including scheduling, enrolment, and progress tracking.
- **Content Creation:** Develop engaging and informative course content to meet the needs of our learners, ensuring relevance and accuracy.
- **Plugin Management:** Maintain and update plugins and tools used in our e-learning platform to enhance user experience and functionality.
- **User Support:** Provide prompt and effective support to users, addressing inquiries, troubleshooting issues, and guiding them through the learning process.
- **Website Maintenance:** Ensure the smooth operation of our e-learning website, performing regular updates, maintenance tasks, and troubleshooting as needed.
- **Analytics/Reporting:** Utilize analytics tools to track course performance, gather insights, and generate reports to inform decision-making and optimize course delivery.

### Qualifications:

- Bachelor's degree in Computer Science/Information Technology or equivalent practical experience.
- Proven experience in managing e-learning courses or similar educational programs.
- Proficiency in web design principles, tools, and technologies.
- Strong communication and interpersonal skills, with the ability to effectively interact with learners.
- Excellent organizational and multitasking abilities, with a keen attention to detail.
- Analytical mindset, with the ability to gather and interpret data to drive improvements.
- Familiarity with content management systems (CMS) and e-learning platforms is preferred.



**Benefits:**

- Opportunity for professional growth and development.
- Collaborative and dynamic work environment.
- Making a meaningful impact by contributing to the success of our e-learning platform.

**Application Process:**

Interested candidates are invited to submit their resume through the Google Forms. We thank all applicants for their interest in joining RockTheIT; however, only those selected for an interview will be contacted.

At RockTheIT, we are committed to creating an inclusive workplace and welcome applications from individuals of all backgrounds and experiences. We encourage candidates with diverse perspectives and skills to apply.





**Laxmi Charitable Trust's**  
**Sheth L.U.J. College of Arts & Sir M.V. College of Science & Commerce**  
**Dr. S. Radhakrishnan Marg, Andheri (East), Mumbai 400 069.**

**Sub Metric No. :** 3.5.1 Number of functional MoUs/linkages with institutions/ industries in India and abroad for internship, on-the-job training, project work, student / faculty exchange and collaborative research during the last five years.

List of year wise activities and exchange should be provided.

**A.Y. 2019-2020**

<b>Sr. No.</b>	<b>Documents</b>
<b>1.</b>	<b>Research Paper - Breast Cancer Detection Using WBCD (Research Paper Publication)</b>



# REVIEW OF RESEARCH

ISSN: 2249-894X

IMPACT FACTOR: 5.7631 (UIF)

UGC APPROVED JOURNAL NO. 48514



---

## BREAST CANCER DETECTION USING WBCD

Kunal Prasad<sup>1</sup>, Mahendra Kanojia<sup>2</sup>, Brian Dsouza<sup>3</sup>, Niketa Gandhi<sup>4</sup>

<sup>1</sup>Department of Computer Science, Sheth L.U.J. and Sir M.V. College, Mumbai, Maharashtra, India.

Email: kunalprasad91@gmail.com

<sup>2</sup>JJT University, Jhunjhunu, Rajasthan, India.

Email: kgkmahendra@gmail.com

<sup>3</sup>Department of Computer Science, Mithibai College, Mumbai, Maharashtra, India.

Email: dsouzabrian18@yahoo.in

<sup>4</sup>Machine Intelligence Research Labs (MIR Labs), Auburn, WA, USA.

Email: niketa@gmail.com

### ABSTRACT

Cancer is a serious disease caused by the abnormal growth of cells. Early detection of cancer helps in diagnosis and complete cure of the disease. Research has been carried on a large scale to detect cancer using information technology. Machine Learning techniques helps to make a system able to learn. Machine learning technique is used in various sectors such as health, finance, education, defence etc. Researchers are in search of best analysis mechanism for bio-medical data with information technology. This paper discusses some machine learning techniques used to detect cancer tissues in the breast. Breast cancer tumours are of two types benign and malignant. Machine learning techniques are an efficient way to detect the early stage of cancer. This paper aims to provide aid to all researchers by giving them an insight into various machine-learning algorithms and the best parameters to detect the malignant in the breast. These algorithms can be implemented to detect cancer at the micro level. level. It gives the guidelines for the implementation of the algorithms on Wisconsin Breast Cancer Dataset (WBCD) for cancer detection. The study reports the comparative study of the algorithms to achieve high accuracy.

**KEYWORDS** — artificial neural network, breast cancer, machine learning, support vector machine, Wisconsin breast cancer dataset.

### INTRODUCTION

Cancer is the most deadly disease, which has raised death rates in recent years. According to the report [1] new cases of cancer recorded are 18.1 million and the death rate due to cancer is 9.6 million in 2018. Ratio of developing cancer throughout their lifetime is 1:5 in men and 1:6 in women, whereas the death ratio is 1:5 and 1:11 in men and women respectively.

Cancer is of different types like lung cancer, breast cancer, oral cancer etc. Cancer can be detected through MRI imaging, CT-scans, Mammography etc. Treatment of cancer depends on the type of cancer. Cancer treatment may follow one line of treatment or may include multiple lines of treatment like surgery, chemotherapy radiation therapy etc. [2]. Late realization of cancer leads to a higher rate of death, so it is necessary to detect it as early as possible.

---

" International Conference on 'Recent Trends in Science' 8- 9<sup>TH</sup> March, 2019 J. S. M. Collge, Alibag-402201."



This paper focuses on work done recently for the detection of breast cancer. This paper discusses machine learning algorithms, which has proven to give better and accurate results for breast cancer detection. It will help other researchers to develop a system using machine learning algorithms to detect breast cancer at an early stage.

#### LITERATURE REVIEW

Research by [3] has conducted a systematic study to evaluate breast cancer detection using SVM classifier. For this study, two types of sequential filters were used. These filters were classified based on their properties. Data were analyzed and results were generated using algorithms of image processing. The result showed that final stage classification using SVM classifier. Thus, the study concluded that SVM Classifier gives the best classification rates.

Another research by [4] conducted a study using three machine learning algorithms on small subset feature set of breast cancer and reported high accuracy. For this study, all three techniques were classified to check the best accurate result. Data was analysed and result was generated using all three classifications. The result showed that SVM and Naive Bayes give almost the same accuracy whereas Naive Bayes in less time complexity gives the predicted result. Thus, the study concluded that Naive Bayes gives the best algorithm to gain accuracy.

This study [5] helps in the detection of cancer using three common machine-learning algorithms, namely SVM, Random Forest (RF) and Bayesian Network (BN). Precision equals to the ratio positive and negative values that were identified by true values, average precision values reported for detection of breast cancer for SVM is 97.0%, RF is 96.6% and BN is 97.2%.

Lothe Savita *et al.*, 2017, has performed research on computer-aided detection used to check the experimentation of next elements. Five processes were involved to check the identification of breast cancer. Data were collected and results generated using SVM classifier. The result classified benign or malignant cells through the classifier. Thus, the study concluded that CAD system could be used to detect and classify breast mass.

A study by [7] implemented machine learning algorithm on feature set of Wisconsin Breast Cancer Dataset (WBCD). For this study, machine learning algorithms used were GRU-SVM, Linear Regression, Multilayer Perceptron (MLP), Nearest Neighbor (NN) search, Softmax Regression and SVM. Data were collected from an online survey. Data was partitioned to 70% and 30% as training-set and test-set respectively. Seven parameters were considered to prove the result, which were test accuracy, epochs, number of data points, false positive rate (FPR), false negative rate (FNR), true positive rate (TPR) and true negative rate (TNR). Data were analysed and results were generated using six machine learning algorithms. The study concluded that all six machine learning algorithms could give us an accuracy of 99.04% whether breast cancer is benign or malignant.

Another study by [8] has completed work on automated detection and classification of breast cancer. For this study, mammography images were used. Data was collected from various hospitals in the form of images, and the result was generated using IDL technique. The result showed 82.50% of accuracy in detecting breast cancer.

Another research by [9] proposes a synthesized model with multiple machine-learning algorithms including SVM, Artificial Neural Network (ANN), K- Nearest Neighbor (KNN) and Decision Tree (DT). This model can be used on different types of data such as image, blood etc.

This study [10] used multiple machine learning algorithms and processed routine blood test results to understand the effectiveness of these algorithms in cancer detection. Algorithms used were ANN, Extreme Learning Machine (ELM), SVM, and KNN. Ten attributes of UCI dataset were used in this study. Accuracy rate achieved by ANN is 79.4304% in 0.4282 sec, ELM performed pretty well with an accuracy of 80% in 0.0075 sec, KNN with little less accuracy 77.5% in 0.15781 sec and SVM with 73.5% accuracy in 0.1866 sec.

