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| <b>Full Name:</b>             | Leonard Peter Binamungu |
| <b>Country of Citizenship</b> | Tanzania                |

## 1. Education

| <b>Institution</b>                    | <b>Years attended</b> | <b>Award obtained</b>                       | <b>Grade</b>                 |
|---------------------------------------|-----------------------|---|------------------------------|
| University of Manchester, UK          | 2016-2020             | PhD in Computer Science                     | Pass                         |
| Osmania University, Hyderabad, India  | 2010-2012             | MSc in Computer Science                     | First class with distinction |
| University of Dar es Salaam           | 2006-2009             | BSc in Computer Science                     | First class with honours     |
| Mzumbe Secondary School               | 2004-2006             | Advanced Certificate of Secondary Education | Division one                 |
| Bwiru Boys Technical Secondary School | 2000-2003             | Certificate of Secondary Education          | Division one                 |

## 2. Employment record

| <b>Period</b>     | <b>Employing organization and your title/position</b>     | <b>Country</b> | <b>Summary of activities performed</b>   |
|-------------------|---|----------------|--|
| July 2020-Present | University of Dar es Salaam, Lecturer in Computer Science | Tanzania       | <ul style="list-style-type: none"> <li>• Prepare learning materials for undergraduate and postgraduate students</li> <li>• Conduct lectures, tutorials, labs, and seminars for undergraduate and postgraduate students</li> <li>• Conduct formative and summative assessments</li> </ul> |

|                       |  |          |   |
|-----------------------|--|----------|---|
|                       |  |          | <p>for undergraduate and postgraduate students</p> <ul style="list-style-type: none"> <li>• Supervise undergraduate projects and postgraduate research projects</li> <li>• Conduct research and publish research results</li> <li>• Undertake consultancy activities for various clients</li> </ul>                           |
| August 2012-July 2020 | Salaam, Assistant Lecturer in Computer Science | Tanzania | <ul style="list-style-type: none"> <li>• Prepare learning materials for undergraduate students</li> <li>• Conduct lectures, tutorials, labs, and seminars for undergraduate students</li> <li>• Conduct formative and summative assessments for undergraduate students</li> <li>• Supervise undergraduate projects</li> </ul> |

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|----------------------------|--|----------------|---|
|                            |  |                | <ul style="list-style-type: none"> <li>• Conduct research and publish research results</li> <li>• Undertake consultancy activities for various clients</li> </ul>   |
| November 2009- August 2012 | Salaam, Tutorial Assistant in Computer Science               | Tanzania       | <ul style="list-style-type: none"> <li>• Prepare learning materials for undergraduate students</li> <li>• Conduct tutorials, labs and seminars for undergraduate students</li> <li>• Conduct formative and summative assessments for undergraduate students</li> <li>• Assist the supervision of undergraduate projects</li> <li>• Conduct research and publish research results</li> <li>• Undertake consultancy activities for various clients</li> </ul> |
| February 2016 – June 2019  | Graduate Teaching Assistant, Department of Computer Science, | United Kingdom | <ul style="list-style-type: none"> <li>• Teaching of various</li> </ul>   |

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|--|--------------------------|--|---|
|  | University of Manchester |  | undergraduate courses <ul style="list-style-type: none"> <li>• Practical support for various undergraduate courses</li> <li>• Evaluation of various undergraduate projects</li> </ul> |
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**3. Membership in Professional Associations and Publications:**

**3.1. Membership in Professional Associations:**

- Professional Member, Association for Computing Machinery (ACM), Membership No 2350003 (2023-to date)
- Student Member, Association for Computing Machinery (ACM), (2017-2019)
- Member of the University of Dar es Salaam Academic Staff Assembly (2009-to-date)
- Member of the Agile Software Engineering Research Group, University of Manchester (2020-to date)
- Member, Centre for Development Informatics, University of Manchester, UK (2017-2020)

**3.2. Publications:**

- **L.P. Binamungu:** The role of source systems strengthening in the effective interoperability of digital health systems. Proceedings of the IFIP Working Group 9.4 Conference on the Implications of Information and Digital Technologies for Development, Cape Town, South Africa, May 2024, Cham: Springer Nature Switzerland.
- **L.P. Binamungu, S. Maro, G. Justo, and J. Ndanguzi:** Assessing software safety knowledge and skill gaps in Tanzania. Proceedings of the IST-Africa 2024, IEEE, Dublin, Ireland, May 2024
- **L.P. Binamungu, and S. Maro:** Behaviour Driven Development: A Systematic Mapping Study. The Journal of Systems and Software 2023, 203(2023) 111749, Elsevier
- **L.P. Binamungu, and M. Mahundi:** Investigating the Support for Agility in Developing Government Software Systems: A Case of Three East African Countries. Tanzania Journal of Engineering and Technology 2022, 41(3):1-13
- **G. Justo, L. Binamungu, and F. Clemence:** Improving Robustness of Optimized Parameters Gradient Tree Boosting for Crime Forecast Model. 1st International Conference on Technological Advancement in Embedded and Mobile Systems (ICTA-EMOS), Arusha, Tanzania, November 2022, Cham: Springer Nature Switzerland, 2022.

- **L. Binamungu**, H. Uledi, A. Maguya, P. Komba, N.F. Joel, P. Makhanda, and W. Mtewe: Information and Computer Studies for Secondary Schools, Student's Book, Form Four. Tanzania Institute of Education. 2022. ISBN: 978-9987-09-463-9.
- **L.P. Binamungu**, and J. T. Mbelwa: Empirical Distribution of Code Reviews in DHIS2 Repositories and the Impact of Code Reviews on the Popularity of DHIS2 Repositories on GitHub. 2020 African Conference on Software Engineering (ACSE 2020), CEUR-WS.org, Nairobi, Kenya, September 2020
- **L.P. Binamungu**, S. Embury, N. Konstantinou: Characterising the Quality of Behaviour Driven Development Specifications. 21st International Conference on Agile Software Development (XP 2020), Springer, Cham, Copenhagen, Denmark, June 2020
- A. Baryashaba, A. Musimenta, S. Mugisha, and **L.P. Binamungu**: Investigating the adoption of an integrated hospital information system in rural Uganda: A case of Kisiizi Hospital. In International Conference on Social Implications of Computers in Developing Countries, Springer, Cham, Dar es Salaam, Tanzania, May, 2019
- **L.P. Binamungu**, S. Embury, N. Konstantinou: Maintaining Behaviour Driven Development Specifications: Challenges and Opportunities. 25th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER 2018), IEEE, Campobasso, Italy, March 2018
- **L.P. Binamungu**, S. Embury, N. Konstantinou: Detecting Duplicate Examples in Behaviour Driven Development Specifications. 2018 IEEE Workshop on Validation, Analysis and Evolution of Software Tests (VST), IEEE, Campobasso, Italy, March 2018
- **L.P. Binamungu**: Detecting and Correcting Duplication in Behaviour Driven Development Specifications. PhD Thesis, Department of Computer Science, University of Manchester, 2020
- **L.P. Binamungu**: Using Science, Technology, and Innovation to Develop Africa: Progress, Challenges, and Opportunities. 13th Mwalimu J.K. Nyerere Centennial Intellectual Festival, University of Dar es Salaam, Dar es Salaam, Tanzania, June 2022

My personal website ([lepebina.github.io](http://lepebina.github.io)) can facilitate access to some of the PDFs of these papers. I have also co-authored several papers, which are still in the peer review process in various internationally reputable journals.

#### 4. Areas of Work and Expertise

Software Engineering and Information Systems are my main areas of research, teaching and consultancy. Specifically, my Software Engineering research covers the following areas: software smells, clone detection, mining software repositories, empirical software engineering, automated software testing (acceptance test-driven approaches), and static and dynamic program analysis. As well, I am keen about research on the design, development, implementation, evaluation, and interoperability of Information Systems, particularly in the context of developing countries. I am always happy to be contacted for a chat by students or researchers working or wanting to work around these areas.

## 5. Language Skills

| Language  | Reading   | Speaking  | Writing   |
|-----------|-----------|-----------|-----------|
| English   | Excellent | Excellent | Excellent |
| Kiswahili | Excellent | Excellent | Excellent |

## 6. Selected Projects

The following is the list of some of the key projects I have been involved in.

| S/N | NAME OF THE ASSIGNMENT                                | CLIENT  | POSITION ASSUMED:                                   | DATES                   | BRIEF DESCRIPTION OF THE ASSIGNMENT AND TASKS UNDERTAKEN  |
|-----|---|---|---|-------------------------|---|
| 1   | TSCMIS Evaluation                                     | Shule Bora project under Cambridge Education  | Consultant  | August to November 2022 | Conduct a high-quality diagnosis/audit of the Teachers Service Commission Management Information System, and advise Shule Bora on best way to complete development and deployment of the system.  |
| 2   | Assessment of Malaria Information Systems in Zanzibar | Population Service International (PSI) under the support of President's Malaria Initiative (PMI). | Consultant  | May 2023 to date        | Assessment of electronic information systems that are used for Malaria surveillance in Zanzibar, to establish their strengths, weaknesses and how they could be improved to facilitate more coordinated efforts to eliminate Malaria in Zanzibar. |
| 3   | Implementation of the national e-health architecture  | Ministry of Health, Tanzania  | Researcher, system analyst and national implementer | 2009 to date            | Development, customization, training, deployment, and user support for DHIS2 in Tanzania, Africa and the rest of the world. The project   |

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|   |   |                              |   |              | has also generated scientific insights that have advanced the literature on the implementation of information systems in developing countries  |
| 4 | Development of the National Human Resources for Health Information System | Ministry of Health, Tanzania | Researcher, system analyst and national implementer | 2009 to date | Develop and train and support users of the Human Resource for Health Information Software (HRHIS), a software to facilitate the collection and analysis of information related to the health workforce of the entire country of Tanzania, with the aim of informing the decision making process on the country health workforce agenda. The project has also generated scientific insights that have advanced the literature on the implementation of information systems in developing countries. |
| 5 | eIDSR Tanzania  | Ministry of Health, Tanzania | Team member   | 2013 to date | Responsible for analysis, development, training and national deployment of the electronic Integrated Diseases Surveillance and Response (eIDSR) system. The system facilitates immediate and weekly reporting of certain diseases of public health importance through mobile phones, to inform diseases surveillance and response teams in a bid to contain the spread of diseases. The  |

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|   |                     |                              |                     |              | project has generated scientific insights on the use of mobile technology to improve surveillance of outbreak diseases in the developing world.   |
| 6 | Systems integration | Ministry of Health, Tanzania | Lead System Analyst | 2020 to date | Integrating Hospital Management Information Systems of 12 tertiary hospitals in Tanzania with the DHIS2, so that data from the referral, consultant and specialized hospitals across the country can be available in the national HMIS data warehouse (DHIS2), to inform planning, management, and decision making of healthcare services in the country. I am the Project Lead on the UDSM side. Through various meetings and workshops with stakeholders from tertiary hospitals and their respective system vendors, so far, we have managed to integrate management systems for six tertiary hospitals with the DHIS2 and talks to integrate the remaining six are still ongoing. Also, from November 2020 to date, the Ministry of Health in Tanzania is currently working on a project to improve HRHIS by integrating all HRH systems across the country--pre- |



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|   |   |  |                        |                     | service, in-service, and HRH professional council systems—to facilitate holistic analysis, planning, management, and decision making on the country’s workforce agenda. A total of 8 systems are participating in this integration by exchanging data with the HRHIS.  |
| 7 | Strengthening safety considerations in software engineering practices in Tanzania | Department of Computer Science and Engineering, University of Dar es Salaam and the Tanzania Information and Communications Technologies Commission (ICTC) | Principal Investigator | July 2022 to date   | I have been involved in needs assessment, curriculum and materials development, and facilitating the training workshops for professional software engineers in Tanzania on the development of safety-critical software systems. Both face-to-face and self-paced versions of the course have been developed and administered to more than 100 software engineers in Tanzania Mainland and Zanzibar. The work is supported by the Royal Academy of Engineering, UK. |
| 8 | Development of templates and guidelines for Software Quality Assurance            | Tanzania Revenue Authority   | Consultant             | February-March 2024 | I was part of the team that was engaged by the Tanzania Revenue Authority to develop the templates and guidelines for Software Quality Assurance in Tanzania Revenue Authority. The developed templates and guidelines   |

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|    |   |   |                       |                   | focus on ensuring quality across the software development lifecycle.  |
| 9  | Assessment of the Tanzania Electronic Single Window System  | Tanzania Revenue Authority  | Consultant            | October 2023      | I was engaged by the Tanzania Revenue Authority to conduct a thorough assessment of the Tanzania Electronic Single Window System, and use the assessment results to develop a roadmap for the deployment, maintenance and support of the system.  |
| 10 | Guardians   | The University of Dar es Salaam Mwalimu Nyerere Professorial Chair on Pan-African Studies | Researcher and author | June 2023-to date | I was engaged in the Guardians project by the UDSM's Mwalimu Nyerere Professorial Chair in Pan African Studies to conduct research and write a book chapter on <i>Digitalisation and Human Mobility</i> . Using evidence from the Tanzania Immigration Services Department and the review of literature, the draft of the book chapter has been produced and is in the publication process. |
| 11 | Development of the national guidelines for the integration of ICT in technical and vocational education | Tanzania Ministry of Education, Science and Technology                                    | Member                | August 2024       | I was a member of the team responsible for the development of the national guidelines for the integration of ICT in the regulatory as well as teaching, learning, and administration activities of the technical and vocational training institutions across the country. The guidelines were conducted based on  |

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|    |  |  |        |                | the National Digital Education Strategy (2024) and other relevant policy frameworks.   |
| 12 | Development of the national guidelines for the integration of ICT in basic education | Tanzania Ministry of Education, Science and Technology | Member | September 2024 | I was a member of the team responsible for the development of the national guidelines for the integration of ICT in the regulatory as well as teaching, learning, and administration activities of the pre-primary, primary, schools, and teacher colleges across the country. The guidelines were conducted based on the National Digital Education Strategy (2024) and other relevant policy frameworks. |

## 7. Selected awards

- Awardee of the 2022 Engineering X programme (Engineering Skills where they are most required) offered by the Royal Academy of Engineering, UK. This was through the project on Strengthening Safety Considerations in Software Engineering Practices in Tanzania.
- First winner at the college level and first runner up at the university level in the category of Best University-Industry Partnership Project during the 2024 University of Dar es Salaam Research and Innovation Exhibitions. This was after showcasing the research results and practical achievements of the project on Strengthening Safety Considerations in Software Engineering Practices in Tanzania
- Best Academic Paper Award, the 2022 Tanzania Annual ICT Professionals Conference (TAIC-2022), Zanzibar
- Recipient of the 2016 University of Manchester Tom Kilburn scholarship for international students to pursue a PhD in Computer Science at the University of Manchester.

- Recipient of Indian-African Scholarship award for MSc training in India from July 2010 to June 2012

## 8. Service

- PC Member, Posters and Tools Demo track, 2024 International Conference on Requirements Engineering ([RE 2024](#))
- Reviewer, Journal of Software: Evolution and Process ([JSME](#)), published by WILEY
- Reviewer, Journal of Information and Software Technology ([IST](#)), published by ELSEVIER
- Reviewer, Journal of the Brazilian Computer Society ([BCS](#)), published by Springer
- Shadow PC Member, 18th International Conference on Mining Software Repositories ([MSR 2021](#))
- PC Member, African Conference on Software Engineering ([ACSE 2020](#))
- Contribution to the development of [the Checklist for Digital-Transformation-for-Development \(DX4D\) Research](#)
- Board Member, College of Information and Communication Technologies, University of Dar es Salaam, 2022 to date
- Coordinator of Research, Publication, and External Links, College of Information and Communication Technologies, University of Dar es Salaam, 2021 to date
- Coordinator of Research and Publication, Department of Computer Science and Engineering, College of Information and Communication Technologies, University of Dar es Salaam, 2020 to 2021
- Coordinator of Curriculum Review, Department of Computer Science and Engineering, University of Dar es Salaam, 2022 to date
- Team member for the development of a joint CoET-ColICT proposal for the transformation of engineering and technology education at the University of Dar es Salaam, 2023- 2024
- Convener of the team for the development of the proposal to transform the Centre for Virtual Learning of the University of Dar es Salaam so that it can effectively support blended and online programmes at the University, August 2024 to date
- Member of the team to develop the Strategic and implementation plans of the College of Information and Communication Technologies, University of Dar es Salaam, 2021 to 2022.
- Examiner and member of several PhD viva voice committees, 2021 to date.
- Examiner of several MSc dissertations and theses.

## 9. Teaching

I have taught the following courses at the University of Dar es Salaam, and similar courses at the University of Manchester, UK

- CS 335: Software Engineering

- IS 181: Web Programming
- IS 292: Object Oriented Programming
- IS 142: Introduction to High Level Programming
- CS 433: Software Testing and Quality Assurance
- IS 605/CS 606: Research Methodology in Science and Engineering
- IS 666: Integrated Health Information Systems Architecture

## 10. Research Mentorship

A total of six MSc students have graduated under my mentorship. Some of the recent graduates include the following:

- Fatuma S. Kombo: Developing Guidelines for Improving Information Security Risk Management Practices in Higher Education Institutions: A Case of Selected Universities in Tanzania (MSc in Information Systems Management, May 2021)
- Festo S. Clemence: An Improved Crime Forecast Model Using Optimized Parameters Gradient Tree Boosting with Minimum Pseudo-Response Value (MSc in Computer Science, December 2021)
- Danford E. Phiri: An Empirical Investigation of Extent, Causes and Management of Technical Debt Accumulation in Government Organizations Software Systems (MSc in Computer Science, May 2022)
- Imani J. Mwendamseke: Predicting the Readability of Behaviour Driven Development Scenarios (MSc in Data Science, May 2023)

The following students are continuing with their research:

- Eliah Mbwilo: Optimizing Malaria Resource Allocation Using Actor-Critic Reinforcement Learning: A Sub-National Approach in Tanzania (MSc in Computer Science, about to graduate)
- Other six are still at different research stages.

## 11. Contact information:

Ee-mail: [lepebina@udsm.ac.tz](mailto:lepebina@udsm.ac.tz)/[lepebina@gmail.com](mailto:lepebina@gmail.com), phone: +255764876753

## 12. Referees

- Prof Joel Mtebe, Principal, College of Information and Communication Technologies, University of Dar es Salaam, Mobile: +255715383366, Email: [jmtebe@gmail.com](mailto:jmtebe@gmail.com)
- Dr Suzanne M. Embury, Reader in Software Engineering, Department of Computer Science, University of Manchester ([suzanne.m.embury@manchester.ac.uk](mailto:suzanne.m.embury@manchester.ac.uk))

- Dr Honest Kimaro, Senior Lecturer and Coordinator of the UDSM DHIS2 Lab, Department of Computer Science and Engineering, College of Information and Communication Technologies, University of Dar es Salaam, Mobile: +255758392001, Email: [honestck@gmail.com](mailto:honestck@gmail.com)

**Certification:**

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes myself, my qualifications, and my experience. I understand that any misstatement or misrepresentation described herein may lead to my disqualification or similar actions.

Leonard Peter Binamungu



17/09/2024

Name of applicant

Signature

Date