# Thilina Buddhika

@ thilinab@cs.colostate.edu www.thilinamb.com (970) 372-9159
www.linkedin.com/in/thilinamb github.com/thilinamb

## Education

- **Ph.D, Computer Science** - GPA 4.0/4.0 (In Progress) **Jan., 2016 – Feb., 2020 (expected)**
  *Colorado State University* *Fort Collins, Colorado, USA*
- **M.S., in Computer Science** - GPA 4.0/4.0 **Aug., 2013 – Dec., 2015**
  *Colorado State University* *Fort Collins, Colorado, USA*
- **B.Sc. (Honors), Computer Science and Engineering** - GPA 4.02/4.2 **Feb., 2005 – Apr., 2009**
  *University of Moratuwa* *Moratuwa, Sri Lanka*

## Research Interests

- Distributed Stream Processing, Large Scale Data Processing, Internet of Things, Edge Computing

## Professional Experience

- **Colorado State University** **Fort Collins, CO**
  *Graduate Research Assistant* *Jun., 2015 - Present*
  - *Gossamer:* Leveraging frequency based sketching algorithms, e.g.: Count-Min, Misra-Gries algorithm, for efficient transfer, scalable storage, and fast querying of multi-attribute time series data streams in IoT and continuous sensing environments. Our approach demonstrated significant reductions in bandwidth consumption and energy consumption at edge devices (up to 99% and 96% respectively) using real world datasets. Further, it reduced the disk I/O up to 99% and network I/O up to 86% during data analysis tasks performed using Spark and Hadoop.
  - *Synopsis:* - Distributed in-memory sketching of spatio-temporal data streams for efficient querying and reconstruction of representative datasets. Synopsis was able to achieve up to $1:1285$ compaction ratio through its sketching algorithm while providing $\sim 10\times$ query speedup compared to SparkSQL.
  - *Neptune:* - High-throughput stream processing for IoT and continuous sensing environments. With the in-built optimizations such as application level buffering, batched processing, backpressure, object reuse, and dynamic compression Neptune was able achieve up to $\sim 14\times$ improvement in throughput compared to Apache Storm. Neptune's proactive online scheduling algorithm is able to efficiently alleviate performance hotspots through targeted task migrations within the cluster.
- **Colorado State University** **Fort Collins, CO**
  *Graduate Teaching Assistant* *Sep., 2013 - May, 2015*
  - *Courses:* Introduction to Distributed Systems, Database Systems, Systems and Network Administration, Object Oriented Problem Solving
- **WSO2 Inc.** (*An open source enterprise integration company - https://wso2.com*) **Colombo, Sri Lanka**
  *Software Engineer* *Apr., 2009 - Jul., 2012*
  - Lead the WSO2 Identity Server team for one and half years delivering two major product releases and several minor releases.
  - Designed and implemented SAML 2.0 based single sign-on support and OAuth 2.0 support in WSO2 Identity Server.
  - Implemented single sign-on support in WSO2 Stratos (Now Apache Stratos) - an open source complete Platform-as-a-Service offering.
  - Implemented OAuth based authentication support in WSO2 API Manager.
- **WSO2 Inc.** **Colombo, Sri Lanka**
  *Intern - Software Engineering* *Oct., 2007 - Apr., 2008*
  - Implemented a JRuby binding for Apache Axis2.

## Awards and Merits

- Invited participant for the $1^{st}$ Google Research Summit *2017*
- Anita Read Graduate Teaching Award *for dedication to education and excellence in teaching* *2015-2016*
- Outstanding Contributor Award, WSO2 Inc. *2011 & 2012*
- Dean's List Recipient *for academic excellence*, University of Moratuwa *2005 - 2009*

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## Select Publications

- **Thilina Buddhika**, Ryan Stern, Kira Lindburg, Kathleen Ericson, and Shrideep Pallickara. Online Scheduling and Interference Alleviation for Low-latency, High-throughput Processing of Data Streams. *IEEE Transactions on Parallel and Distributed Systems.* Vol. 28(12) pp 3553-3569. 2017.
- **Thilina Buddhika**, Matthew Malensek, Sangmi Lee Pallickara, and Shrideep Pallickara. Synopsis: A Distributed Sketch over Voluminous Spatiotemporal Observational Streams. *IEEE Transactions on Knowledge and Data Engineering.* Vol. 29(11) pp 2552-2566. 2017.
- **Thilina Buddhika** and Shrideep Pallickara. Neptune: Real Time Stream Processing for Internet of Things and Sensing Environments. *Proceedings of the 30th IEEE International Parallel & Distributed Processing Symposium.* pp 1143-1152. Chicago, USA. 2016.

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## Open Source Contributions

- **Apache Axis Project**
  *Member of Product Management Committee and Committer* *Jan., 2011 - present*
  - Authored SAML 2.0 support for WS-Trust implementation in Apache Rampart.
  - Performance, documentation and test coverage improvements for Apache Rampart.
- **Apache Flume Project**
  *Contributor* *Sep., 2014*
  - Implemented a Flume sink for Apache Kafka (available with Apache Flume v1.6 release).
- **Google Summer of Code**
  *Apache Rampart Project* *Summer, 2009*
  - Improving the test coverage in Apache Rampart.

  *Apache Tuscany Project* *Summer, 2008*
  - Implemented Tuscany SCA support in Apache Geronimo application server .

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## Professional Service

- **Journal Reviewer**
  *ACM Computing Surveys* *2018*
- **Google Summer of Code**
  *Mentor representing Apache Software Foundation* *2010*

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## Technical Skills

- Programming Languages: *Java, Python, HTML, CSS*
- Standards and Specifications: *SOAP, WS-*, XML Security*
- Operating Systems: *Linux, Windows, MacOS*
- Development Tools: *Git, Subversion, Ant, Maven, Gradle, IntelliJ IDEA*
- Open Source Frameworks: *Apache Hadoop, Apache Spark, Apache Storm, Apache Kafka, Apache Zookeeper*