

# Pritish Mishra

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## Research Projects

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### Distributed Stream Processing Framework

- Designed to resolve challenges for real-world edge deployment of streaming applications that current systems like Apache Flink are unable to handle.
- Proposes a novel zero-stop state migration mechanism to support seamless reconfiguration of stateful applications. Preparing for a submission to VLDB 2023.
- Shepherd, the prior version of this framework designed for stateless applications, was published in ACM/IEEE SEC 2022.

### Geo-distributed Consensus Protocol

- Proposes a new leasing mechanism to maximise the performance of reads without impacting the write performance, specifically for geo-distributed nodes. Preparing for a submission to ATC 2023.

### Federated Learning Framework

- Uses model-partitioning to reduce resource consumption incurred by federated ML models during real-world edge deployment. Specifically targets ML for healthcare as application domain.
- Presented as poster in ACM/IEEE SEC 2021.

### Autonomous Database Services on SAP Cloud Platform

- Generic tuning service that automatically adjusts database configurations as per the current workload.
- Uses bayesian model to identify knobs critical for performance of various workloads and maps the current workload to one of the trained workloads. Prototypes deployed for PostgreSQL, MySQL and AWS RDS.
- Was published in EDBT 2021.

## Professional Experience

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### Developer

June 2019 - Aug 2020

SAP Mobile Services, SAP Labs

**Product:** Snowblind - SDK Library for design of cross-platform applications.

- Developed features like Just-in-time loading for List-pickers control, Analytics Chart and HTTP Image URL Rendering, SDK Designed support for Android/iOS SDK.
- Acted as Application Security Lead, performing penetration testing, threat modelling, I/O operations for application security.

### Developer

Aug 2016 - May 2019

SAP Cloud Platform, SAP Labs

**Product:** [Service-Fabrik broker](#) (CF Incubated Multi-Cloud Broker)

- Developed Multi-AZ HA and ZDM functionality for the cluster-based multi-cloud broker on multiple IaaSes like AWS, GCP, Azure and Openstack.
- Developed Point-in-time Recovery and Fast Restore features for cloud-database services like PostgreSQL, MongoDB and Redis.
- Designed and developed a turbulence framework to ensure the resilience of all Service-Fabrik components against potential disasters like Network Failure, Disk Failure, AZ Failure, etc.
- Implemented Monitoring & Alerting for Service-Fabrik broker and all the services managed by the broker (Postgresql, Redis, MongoDB, RabbitMQ) as part of SAP Cloud Platform.
- Other open-sourced projects: [CLI Plugin](#), [Backup-restore library](#)

## Entrepreneurial Experience

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### Co-founder

June 2019 - Jan 2020

Hubris by SAP

- Productisation of recommendation service for making databases and applications autonomous
- Deployed pilots for popular databases like PostgreSQL, MySQL, AWS RDS and GCP CloudSQL
- Designed the business model, revenue projections, marketing models, FTE resource allocations, etc.
- Acquired a customer group of 1 Large and 5 Small Enterprises

- Adjudged as the best startup idea in Innvent Startup Challenge 2019
- Pitched to SAP Executive Board in Los Angeles for seed funding
- Winner of SAP Stellar Award for Nascent Entrepreneurship 2019 for contributions to Hubris

## Awards & Achievements

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- Winner of SAP Stellar Award for Nascent Entrepreneurship, 2019
- 4 times winner of SLI Quarterly Innovation Award, SAP Labs for Q2, Q4 2018 and Q1, Q2 2019.
- Winner of SAP Innvent Startup Challenge, 2019.

## Peer-Reviewed Publications (Selected)

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Ramprasad, B., Mishra, P., et. al., "Shepherd: Seamless Stream Processing on the Edge", to appear in ACM/IEEE Symposium on Edge Computing, 2022.

Tiwary, M., Mishra, P., Jain, S. and Sahoo, K.S., (2021), "AutoDBaaS: Autonomous Database as a Service for managing relational database services" In *EDBT* (pp. 600-610).

Sahoo K.S., Mishra P., Tiwary. M, Ramasubbareddy S., Baluswamy B., Gandomi A.H. (2019), "Improving End-Users Utility in Software-Defined Wide Area Network Systems" in *IEEE Transactions on Network and Service Management*, Nov-Dec 2019, (Available at Early Access Issue)

Mishra, P., Puthal, D., Tiwary, M. and Mohanty, S.P., (2019). "Software defined IoT systems: Properties, state of the art, and future research" in *IEEE Wireless Communications*, 26(6), pp.64-71.

Mishra P., Tiwary M., Yang L.T., Puthal D. (2018). "S2R: Service trading based response time optimization in mobile edge computing" In 16th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA 2018), 2018/12/11, pp 684-691

For full list, please refer to my [Google Scholar profile](#).

## Patents (Selected)

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Pritish Mishra, Shashank Mohan Jain, Mayank Tiwary, "Generic autonomous database tuning as a service for managing backing services in cloud.", U.S. Patent 11,157,471

Pritish Mishra, Mayank Tiwary, "Connectivity interface optimization recommendation engine for enterprise system.", U.S. Patent 11,188,924.

Pritish Mishra, Mayank Tiwary, "Provisioner disaster-recovery framework for platform-as-a-service offering.", U.S. Patent 10,805,182

Pritish Mishra, Mayank Tiwary, "Cloud resource scaling using programmable-network traffic statistics.", U.S. Patent 10,868,732

Pritish Mishra, Shashank Mohan Jain, Mayank Tiwary (2019), "Function execution based on data locality/gravity", U.S. Patent Application 16/661,016

Pritish Mishra, Shashank Mohan Jain, Mayank Tiwary, ""Generic peer-to-peer platform as a service framework: A web-assembly based execution framework", U.S. Patent Application 16/804,849

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## Industrial Conferences

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- "A Poor-man Serverless framework for cloud-based applications using web-assembly", presented at **CloudFoundry Summit Europe 2019** and **OpenSource Summit Japan 2019**.
- Presented HA and ZDM functionalities of Service-Fabrik broker at the **Cloud Foundry Community Advisory Board (CF CAB) Monthly Meeting**, <https://www.altoros.com/blog/cloud-foundry-advisory-board-meeting-july-2018-intro-to-shield/>
- Demonstrated HA and ZDM functionalities of Service-Fabrik broker at **SAP Developer Kick-Off Meeting (SAP DKOM), 2019**

## Internship

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### Summer Intern

7 May 2015 - 31 July 2015

Dell International

**Product:** Stewarded Reference Table for Enterprise Business Intelligence

**Brief Details:** A self-service ETL portal which extracts and modifies (if required) data of a flat delimited file and pushes the data extracted into the Teradata database. This tool caters to over 1500 users of the enterprise.

### Research Intern

1 May 2014 - 30 June 2014

IIT Bhubaneswar

**Supervisor:** Dr. D.P.Dogra, Asst. Prof., Electrical Sciences

**Project:** Electronic Door Surveillance.

**Brief Details:** A product which records and displays the details of the persons who visited the client in his absence.

## Undergraduate Project

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### A Hybrid Distributed Collaborative Filtering Recommender Engine Using Apache Spark

Proposes a movie-recommendation engine that overcomes challenges faced by the existing technique and leverages the benefits of clustering techniques on Spark to improve the throughput and scalability of the engine.

## Academic History

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**Doctor of Philosophy (PhD), Dept. of Computer Science** 2020 - to date

University of Toronto

GPA - 4.0 / 4.0

**Bachelor of Technology (BTech), Dept. Of Computer Science** 2012 - 2016

International Institute of Information Technology (IIIT), Bhubaneswar

GPA - 8.96 / 10.0

**Higher Secondary** 2010 - 2012

D.A.V. Public School, Cuttack

Score: 89.0%

**Secondary** 2009 - 2010

D.A.V. Public School, Cuttack

GPA - 10.0 / 10.0

## Declaration

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I solemnly declare that all the all the above information is correct to the best of my knowledge and belief.

**Pritish Mishra**