DIPPY AGGARWAL, Ph.D.
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SUMMARY OF QUALIFICATIONS

- 5+ years of professional experience with consistent excellent academic background.
- **Ph.D.** in computer science with dissertation spanning the areas of conceptual modeling, data warehouses, graph, and relational databases.
- **Invited Guest Speaker** @Portland State University, Computer Science (CS 486/586 – Introduction to database management systems), 2019. **Lecture Topic**– Database Benchmarks.
- Experience working on Industry standard database benchmarks including **TPCx-BB, TPC-H, and TPC-DS.**
- Experience **mentoring junior engineers** as well as **communicating with other teams** to collaborate on performance optimizations and experiments design.
- 5+ years of experience identifying performance bottlenecks using performance analysis tools.
- Knowledge of **distributed systems principles** and systems.
- **Internship's work** on the theme of *Green and Sustainable IT* captured and **published online** by news articles: Phys.org [1], Science Codex [2], DERI News [3] and CEAS@UC News [4].
- **Publications and presentations at premier, international conferences and workshops including** ACM SIGCSE 2020, TPCTC 2019/2020 in conjunction with VLDB 2019/2020, IEEE IRI 2016/2019, IEEE Big Data Workshop 2015, SWIM workshop affiliated with ACM SIGMOD 2014.
- **Multiple summer internships** at Insight Centre for Data Analytics[5], Ireland (2011), Teradata, California (2013), InfoTrust LLC , Cincinnati (2015) and Cincinnati Children's HPC Team (2016).
- **Invited panelist** at the 33rd International Conference on Conceptual Modeling, 2014. (Session: Octavian Panel. Old Wine and New Blood - Perspectives on Conceptual Modeling from New Entrants to the Field) and Graduate School Panel at TRiWiC[7] and KY-TRIWiC[8]
- **Program Committee Member/Reviewer** for international conferences: FIE (Frontiers In Education) 2016, Knowledge and Information Systems, 2016, International Conference on Conceptual Modeling, 2018, ACM CODS-COMAD Young Researchers Symposium, 2021, TPC Technology Conference on Performance Evaluation & Benchmarking (2020, 2021, 2022), ICDE 2023 (IEEE International Conference on Data Engineering).
- Two-time scholarship recipient for **Grace Hopper Celebration of Women in Computing** (2012, 2015).
- **Teaching** experience as an **independent instructor** for five courses at the University of Cincinnati: Database Design (Fall 2011), Software Engineering and accompanied lab using Java and UML (Summer 2012), Database Theory (*Graduate Level Course*, Fall 2012), Application Development using Java (Fall 2015).

ACADEMICS

2010 - 2017: Ph.D. Computer Science, University of Cincinnati, Ohio
2008 - 2009: M.S Computer Science, West Chester University, Pennsylvania, **GPA: 3.94 / 4.0**
2004 - 2007: Masters computer applications, Panjab University, India, **GPA: 4.0/4.0, (Gold Medalist)**
2001 - 2004: B.Sc (Hons.) Computer Science, Panjab University, India, **GPA: 4.0/4.0, (Gold Medalist)**

INDUSTRY EXPERIENCE

Intel Corporation, Washington, May'17 – Current

- Led the engineering effort to enable implementation of a big data benchmark for a leading database product.
- Analyze performance metrics and query plans to optimize databases to ensure best performance on Intel architecture.
- Led performance pathfinding efforts for machine learning workloads to identify performance bottlenecks/optimization opportunities and propose solutions.
- *Presented **three** papers at two international conferences - **IEEE IRI Conference 2019 and TPCTC held in conjunction with VLDB, 2019/2020.***

Cincinnati Children's Hospital, DevOps Intern, Ohio, May'16 – October '16

- Dockerizing computational tools and software for the application development and research divisions in BMI.
- Investigated container orchestration platforms including Docker Swarm, Kubernetes, and Mesos.

InfoTrust LLC, Development-Database Intern, Ohio, May'15 – August'15

- Worked on profiling and optimizing the performance of the databases that fuel the products suite built by the company.
- Created database scripts (PostgreSQL) to automate the reporting performed on the data generated by the company's products.
- Wrote technical documentation such as conference papers, technical blogs, applications for award nominations for the company, and reports for maintaining their internal knowledge base.
- Presented paper in **IEEE Big Data Workshop** (Privacy and Security in Big Data), 2015.

Teradata, Query Optimizer Intern, California, June'13 – August'13

- Worked on algorithms to enhance Teradata query optimizer calibration measurements – making them more efficient and automated.

Intellimedia, Software Developer, Pennsylvania, May'09 – Aug'10

- Developed Functional test cases and automated load and Performance testing using Visual Studio Team Edition.
- Participated in debugging and fixing the bugs in the online, offline, and mobile versions.
- Developed stored procedures on SQL Server 2005.
- Designed the product, made the presentation to the management team, obtained approval, and successfully implemented further on.

Fidelity Information Services, Software Developer, India, Jun'07- Dec '07

- Coded web-designed interfaces using Java, XML, Spring Framework.
- Re-engineered the existing code modules to incorporate Hibernate Annotations.

RESEARCH EXPERIENCE

Research Intern, Dr. Edward Curry, Insight Centre for Data Analytics, Ireland

June 1 – August 25, 2011

The project provides a solution to an organization's challenge of reducing its ecological footprint. We develop a framework for visualizing information concerning the power consumption of IT devices in real-time using power metering approaches and leverage semantic web technologies to weave information that is dispersed across different data sources, ranging from an organization's asset databases to excel spreadsheets to the data available on manufacturer's websites. The project also presents a comparative study of power estimation approaches for IT equipment with a two-fold purpose: a) to be able to provide the users with an insight into their devices current power consumption without leaving a footprint on the client's machine b) to analyze if one approach gives accurate results over the others. We have performed an analysis of the following two approaches: Microsoft Joulemeter, Power Estimation using Software Design Methodologies using numbers from smart meters as our benchmark.

- Developed a proof-of-concept for our comparative study of power consumption approaches for IT equipment (laptops and desktops), capturing power consumption in real-time using smart meters as our benchmark.
- Successfully captured lifecycle information stored in **RDF format using SPARQL queries.**
- **Paper accepted and presented at an ACM SIGMOD workshop, 2014**

Research Assistant, Dr. Afrand Agah, West Chester University, PA

April 2008 – April 2009

In this project, we tend to conduct research in the area of wireless communication and sensor networking, in particular, minimum battery discharge in such networks. The goal of this project is to maximize the lifetime of battery-powered wireless sensors. Once wireless sensor networks are deployed, they are expected to run autonomously and with minimum human attendance. In this project, we investigate how various interactions in a wireless sensor network can be modeled as a game theory framework in order to define a utility function that motivates wireless sensor nodes with the new incentive that yields equilibrium for all sensor nodes.

- Developed user manuals for few basic/intermediate practical applications for programming with sensor motes.
- Successfully implemented the effect of putting the motes to sleep by running the experiment for a short duration of four hours and recording the results in tabular and graphical form.
- Theoretically examined the game theoretic concept as an approach to maximize the lifetime of sensors
- **Presented the work at Graduate Research Symposium, Harrisburg.**

Research Assistant, Dr. Joby Hilliker, West Chester University, PA

June 2008 – August 2008

The goal of this project was to optimally adjust short-term hourly temperature forecasts using the current observation and NDFD output. The need for accurate, short-term (i.e., < 6 hrs) forecasts have increased, particularly in the energy industry, where temperature predictions are input to forecast electricity usage. One strategy to obtain accurate, short-term predictions is to adjust the most recently available NDFD (National Digital Forecast Database) forecast output based on its temperature difference to the current observation divided by an adjustment factor.

- Worked on an approach to optimally adjust short-term hourly weather forecasts.
- Developed scripts in PERL for quality control process for the data retrieved from MOS/NDFD database
- Won '**Best Poster Presentation'** award for the project at West Chester University.

PUBLICATIONS

- **Dippy Aggarwal**, Chris L. Elford, Shreyas Shekhar, Avaneesh Shetty. *Microsoft SQL Server – The Case for Single Node Systems Supporting Large Scale Data Analytics.* April 2021. https://download.microsoft.com/download/e/a/c/eaca9657-b61f-4f97-9e24-973d011d5496/The_Case_for_Single_Node_Systems_Supporting_Large_Scale_Data_Analytics.pdf
- Christopher Elford, **Dippy Aggarwal**, and Shreyas Shekhar. Revisiting Issues in Benchmarking Metrics Selection. *Twelfth TPC Technology Conference on Performance Evaluation & Benchmarking (TPCTC 2020)*, Virtual.
- **Dippy Aggarwal,** Charles Winstead, Kristin Tufte. Leveraging Database Benchmarks to Teach Database Concepts. *Proceedings of the SIGCSE technical symposium on Computer science education,* Portland, USA, 2020. (Accepted for publication and presentation at the conference).
- **Dippy Aggarwal**, Shreyas Shekhar. *Towards a Visualization-Driven Approach to Database Benchmarking Analysis*. IEEE International Conference on Information Reuse and Integration, August 2019.
- **Dippy Aggarwal,** Shreyas Shekhar, Chris Elford, Umachandar Jayachandran, Sadashivan Krishnamurthy, Brendan Niebruegge and Jamie Reding. TPCxBB (BigBench) in a single node environment. *Eleventh TPC Technology Conference on Performance Evaluation & Benchmarking (TPCTC 2019)*, Los Angeles, USA, August 2019.
- **Dippy Aggarwal,** Karen C. Davis, Bill Nicholson**.** SEQ-AM: Impact Assessment for Data Warehouse Schema Evolution. (Submitted 2022).
- **Dippy Aggarwal**, Karen C. Davis. *Employing Graph Databases as a Standardization Model towards Addressing Heterogeneity and Integration*. **Book Chapter** in Advances in Intelligent Systems and Computing. (Accepted for publication: December 2016, Published: August 2017)
- Karen C. Davis, **Dippy Aggarwal**, Susan Baskin. 2016. *Scaling Data Warehousing Course Projects*, The 2016 International Symposium on Education, Las Vegas, USA, December 15-17, 2016.
- **Dippy Aggarwal**, Karen C. Davis. 2016. *Employing Graph Databases as a Standardization Model towards Addressing Heterogeneity.* Proceedings of the IEEE 17th International Conference on Information Reuse and Integration, Pittsburgh, July 28-30, 2016.
- **Dippy Aggarwal, Karen C. Davis,** 2016. *Tutorial - Using Pentaho for ETL*. Published online in the Teradata University Network Library.
- Andy Bengel, Amin Shawki, and **Dippy Aggarwal**. 2015. *Simplifying Web Analytics for Digital Marketing*. In Proceedings of 2nd International Workshop on Privacy and Security of Big Data, IEEE Big Data 2015, Santa Clara, California, USA.
- **Dippy Aggarwal**, Edward Curry, and Karen C. Davis. 2014. *Employing Virtual Power Analytics and Linked Data for Enterprise IT Energy Informatics*. In Proceedings of Semantic Web Information Management on Semantic Web Information Management (SWIM'14). ACM SIGMOD 2014, Snowbird, Utah, USA.
- **Dippy Aggarwal**, Karen C. Davis, *Building Metadata Bridges from the Enterprise World to the Cloud Platforms*. 33rd International Conference on Conceptual Modeling (ER'2014), PhD Symposium, Atlanta, Georgia, 2014.

- **Dippy Aggarwal**, Karen C. Davis, *Data Warehouse Design for Cloud Platforms*, Poster Presentation, Grad Cohort CRA-W, Seattle, 2012.

PANELS/TALKS

- Served on a panel, Octavian Panel: Old Wine and New Blood, 33rd International Conference on Conceptual Modeling (ER'2014), Atlanta, Georgia, 2014.
  - Interview with the Graph Connect Team, Neo Technology, San Francisco, CA 2016. Online: https://neo4j.com/blog/dippy-aggarwal-ph-d-candidate-university-cincinnati/
- Neo4j Container Orchestration with Kubernetes, Docker Swarm and Mesos, Presentation at the Graph Connect 2016 Conference, San Francisco, CA, USA.
- Five Tips on Navigating Internship Landscape, Grace Hopper Celebration of Women in Computing, Houston, Texas, 2015.

TEACHING EXPERIENCE

Independent Instructor, University of Cincinnati

Courses: **Database Design** (Fall 2011**), Software Engineering** and accompanied lab using **Java and UML** (Summer 2012), **Database Theory** (***Graduate Level Course***, Fall 2012), **Application Development with Java** (Fall 2015)

Teaching Assistant, University of Cincinnati

Courses: Artificial Intelligence, Automata Theory, Database Theory, Discrete Mathematics,Database Design and Development, Data Structures, Programming Languages, Algorithm Design

HONORS and AWARDS

- **Graduate Student Service Award** - In recognition for the service to the department as voted by the graduate faculty and administration, University of Cincinnati, 2015.
- **Outstanding International Graduate Student Award** in the S.T.E.M. field from the University of Cincinnati, Ohio, 2016.
- **Scholarship recipient from Teradata University Network** to attend ACM SIGCSE Conference, 2016.
- **Best Student Award in Academic Excellence** from West Chester University, Pennsylvania, 2008-2009.

REFERENCES

[1] Phys.org: http://phys.org/wire-news/110030338/green-it-to-be-presented-in-baltimore.html
[2] Science Codex: http://www.sciencecodex.com/green_it_to_be_presented_in_baltimore-98991
[3] DERI news: http://deri.ie/content/green-it-be-presented-baltimore
[4] UC News: http://www.uc.edu/news/NR.aspx?id=16560
[5] DERI: https://insight-centre.org/
[6] ACM-W: http://women.acm.org/
[7] TRIWiC: http://triwic.acm.org/
[8] KY-TRIWiC: http://triwic.nku.edu/
[9] GATE: https://www.uc.edu/cetl/gate.html