

# Sanjaya Wijeratne | CV

Ph.D. in Computer Science and Engineering  
San Francisco Bay Area, CA

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## Career Objectives and Research Interests

To become a successful research scientist in the field of Computer Science who is capable of providing solutions to challenging problems using cutting edge technology and tools. Main research interests include Emoji Understanding, Emoji Sense Disambiguation, Word Sense Disambiguation, Text Mining, Natural Language Processing and Applied Machine Learning.

## Education

### Wright State University

Dayton, Ohio

Ph.D. in Computer Science, GPA – 3.94/4.0, Best Ph.D. Student 2017 – 2018

Sep., 2011 – Dec., 2018

Thesis – *A Framework to Understand Emoji Meaning: Similarity and Sense Disambiguation of Emoji using EmojiNet*

Thesis Advisor – Prof. Amit Sheth

### University of Moratuwa

Katubedda, Sri Lanka

B.Sc. in Information Technology, Top of the Class with First Class Honours

2005 – 2009

Thesis Advisor – Dr. Ajith Madurapperuma

## Research Experience

### Graduate Research Experience.....

#### Kno.e.sis Center – Wright State University

Dayton, Ohio

Researcher/Graduate Research Assistant

Sep., 2011 – Dec., 2018

Working on research problems related to Emoji Understanding, Emoji Sense Disambiguation, Word Sense Disambiguation, Text Mining, Natural Language Processing and Social Computing.

#### Selected Research Projects

##### - EmojiNet and Emoji Understanding

- Emoji is a contemporary, extremely popular way to enhance electronic communications. Without rigid semantics attached to them, an emoji symbol can take on different meanings based on the context of a message. Analogous to the word sense disambiguation task in natural language processing, machines also need to disambiguate the meaning of an emoji or ‘sense’ of an emoji. The goal of this project is to build tools and algorithms to improve machine understandability of emoji.

Project Demo – <http://emojinet.knoesis.org/home.php>

Publications – [Web Intelligence ‘17] | [ICWSM ‘17] | [SocInfo ‘16] | [Wright Brother’s Day ‘16]

Invited Talks – [Emojicon ‘18]

Press Coverage – [WIRED.com] | [News 18] | [Wright State News] | [The Daily Advocate] | [Sidney Daily News] | [Emoji Foundation] | [Kaggle] | [Psychology Today] | [dlvr.it Blog]

##### - Twitris 3.0 – Understanding Gang Activities in Social Media

- In this project, we try to understand how street gang members (self-identified in their Twitter profiles) use social media. We try to develop algorithms to identify gang member Twitter profiles automatically using the language they use in social media posts, using the profile descriptions and/or their follower/followee networks.

Publications – [ASONAM ‘16] | [SML@IJCAI ‘16] | [ChASM@SocInfo ‘16] | [IEEE ISI ‘15]

Invited Talks – [SRV 2000 – Engaged Citizenship Class at WSU ‘18] | [WSU Big Data ‘16]

Press Coverage – [Wright State News] | [IEEE Intelligent Systems] | [Motherboard (Vice.com)]

## Research Internships.....

### **Institute for Infocomm Research (I2R) – A\*Star**

**Fusionopolis, Singapore**

*Research Intern*

*January, 2016 – April, 2016*

Successfully completed a 16 weeks internship program at the Institute for Infocomm Research (I2R) - A\*Star, Singapore. Worked with the Text Analytics and Semantics Group at Data Analytics Department on entity linking in short text descriptions appear in private merchant datasets.

### **Insight Center for Data Analytics (Formerly DERI) – NUIG**

**Galway, Ireland**

*Summer Research Intern*

*May, 2014 – August, 2014*

Successfully completed a fifteen weeks summer internship at Insight Center for Data Analytics (formerly known as Digital Enterprise Research Institute – DERI) at National University of Ireland – Galway. Worked with Digital Humanities and Journalism (HuJo) group on a sub module of RTÉ News360 project to filter noisy tweets collected by keywords-based tweet filtering methods using Word Sense Disambiguation.

## Teaching Experience

### **Dep. of Computer Science and Engineering, Wright State University**

**Dayton, Ohio**

*Graduate Teaching Assistant,*

*From August, 2013 – April, 2014 and From August, 2017 – April, 2018*

Worked as a Teaching Assistant for CS 1150 – Introduction to Computer Science course while teaching all labs and selected classes, writing programming assignments and grading labs.

## Software Engineering Experience

### **CodeGen International (Pvt) Ltd.**

**Colombo, Sri Lanka**

*Software Engineer*

*November, 2009 – July, 2011*

Contributed to designing and development of cutting edge travel software, integrating third-party host to host systems for flight and cruise bookings. Integrated and worked with leading GDSes while engaging in customer requirement gathering sessions.

### **Virtusa Corporation (Pvt) Ltd.**

**Colombo, Sri Lanka**

*Trainee Software Engineer*

*October, 2007 – April, 2008*

Designed and developed self-describing on the fly GUI generation software to represent any given XML document and a tool to calculate the complexity of a XML document.

## Awards and Accomplishments

### Graduate Studies.....

#### **Outstanding Student Award in the Ph.D. Program in Computer Science**

**2017 – 2018**

*College of Engineering and Computer Science, Wright State University*

*Dayton, Ohio*

Awarded the Graduate Student Excellence Award (a.k.a. Outstanding Student Award) by the Graduate School of Wright State University, in recognition of the outstanding academic achievements in the Ph.D. Program in Computer Science and Engineering during the academic year 2017 - 2018. **Each graduate program may nominate only one student for this award.**

#### **ICWSM-18 Student Grant Award**

**2018**

*Association for the Advancement of Artificial Intelligence (AAAI)*

*Palo Alto, California*

Received a travel grant of \$350 to attend the 12th International AAAI Conference on Web and Social Media (ICWSM-18).

#### **Graduate Council Fellowship Award**

**2011 – 2013**

*College of Engineering and Computer Science, Wright State University*

*Dayton, Ohio*

Awarded the Graduate Council Fellowship by the College of Engineering and Computer Science of Wright State University beginning Fall 2011 up to two years which consists of a monthly stipend and a full tuition fellowship. **Each graduate program may nominate only one student for this award.**

### Undergraduate Studies.....

#### **Gold Medal for the Best Overall GPA**

**June, 2010**

*Faculty of Information Technology, University of Moratuwa*

*Katubedda, Sri Lanka*

Became the top of the class (**Valedictorian**) out of 102 students and won the Gold Medal for the Information Technology Graduate who obtained the highest overall GPA at the B.Sc. in Information Technology Honours Degree Program conducted by the Faculty of Information Technology, University of Moratuwa, Sri Lanka.

### **Dean's List Award**

**2005 – 2009**

*Faculty of Information Technology, University of Moratuwa*

*Katubedda, Sri Lanka*

Won a place in the Dean's List in five academic semesters for the outstanding academic performance by achieving a semester GPA above 3.80 at the B.Sc Information Technology Honours Degree Program conducted by the Faculty of Information Technology - University of Moratuwa, Sri Lanka.

## **Media Coverage**

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### **EmojiNet Project**.....

- [1] "Academics Gathered to Share Emoji Research, and It was Lit", by Arielle Pardes, Senior Editor, WIRED.COM, June, 2018. [Link to Article]
- [2] "Universal Language or Culturally Specific Symbols, What Do Emojis Really Mean?", by Rakhi Bose, News 18, June, 2018. [Link to Article].
- [3] "KnoEmoji Empire: Wright State Researchers Develop Database that Promises to Improve Emoji Communication", by Jim Hannah, Wright State University, January, 2018. [Link to Article].
- [4] "Wright State Defines Emojis", by Carolyn Harmon, The Daily Advocate, January, 2018. [Link to Article].
- [5] "Wright State Student Develops Emoji Software", by Jim Hannah, The Sidney Daily News, January, 2018. [Link to Article].
- [6] "Can Computers "Get" Emoji? EmojiNet Says YES!", by Sarah Vickers-Webb, Emoji Foundation, December, 2017. [Link to Article].
- [7] "Do You Know What That Emoji Means?: Researchers Take a Closer Look at the Meaning of Emojis", by Marlynn Wei (M.D., J.D.), Psychology Today, October, 2017. [Link to Article].
- [8] "How to Use Emojis the Right Way in Social Media", by Debra Garber, dlvr.it Blog, August, 2016. [dlvr.it Blog].

### **Twitter Gangs Project**.....

- [1] "Gang Guidance: Wright State Researchers Develop Computer Tool Designed to Reduce Street-gang Violence", by Jim Hannah, Wright State University, March, 2018. [Link to Article].
- [2] "Twitter: How Social Media Intersects with Influence, Jihad, Gangs, Drugs", by Michael Martinez and Lori Cameron, IEEE Intelligent Systems, October, 2017. [Link to Article].
- [3] "Researchers Claim AI Can Identify Gang Members on Twitter", by Jordan Pearson, Motherboard (Vice Media LLC), November, 2016. [Link to Article].

## **Invited Talks**

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- [1] **Sanjaya Wijeratne**, "Emoji Semiotics, Culture, and Society", Anthropology 189 – Anthropology of Social Media: The Study of Emoji class at The University of California - Berkeley, USA. February, 2019.
- [2] **Sanjaya Wijeratne**, "A Framework to Understand Emoji Meaning: Similarity, Sense Disambiguation, and Prediction of Emoji using EmojiNet", Emojicon 2018, Brooklyn, NY, USA. July, 2018.
- [3] **Sanjaya Wijeratne**, "Analyzing the Social Media Footprint of Street Gangs", SRV 2000 – Engaged Citizenship class at Wright State University, Dayton, OH, USA. March, 2018.
- [4] **Sanjaya Wijeratne**, "Finding Street Gang Members on Twitter", Big Data Surveillance Analytics Mini Conference at Wright State University, Dayton, OH, USA. July, 2016.

## Tutorials

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- [1] **Sanjaya Wijeratne**, Amit Sheth, Horacio Saggion. Improving Emoji Understanding Tasks using EmojiNet, 1st International Workshop on Emoji Understanding and Applications in Social Media (Emoji2018), co-located with The 12th International AAAI Conference on Web and Social Media (ICWSM-18), Stanford, California, USA, June, 2018.

## Publications

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### Book Chapters.....

- [1] **Sanjaya Wijeratne**, Amit Sheth, Shreyansh Bhatt, Lakshika Balasuriya, Hussein Al-Olimat, Manas Gaur, Amir Hossein Yazdavar, Krishnaprasad Thirunarayan. Feature Engineering for Twitter-based Applications, in Feature Engineering for Machine Learning and Data Analytics. Editors. Guozhu Dong and Huan Liu. Chapman and Hall/CRC Data Mining and Knowledge Discovery Series. 2018.

### Journal Papers.....

- [1] R. Daniulaityte, R. Nahhas, **S. Wijeratne**, R. Carlson, F. Lamy, S. Martins, E. Boyer, G. Smith, and A. Sheth. "Time for dabs": Analyzing Twitter data on marijuana concentrates across the U.S., Drug and Alcohol Dependence, Volume 155, 1 October 2015, Pages 307-311, ISSN 0376-8716.

### Conference Papers.....

- [1] **Sanjaya Wijeratne**, Lakshika Balasuriya, Amit Sheth, Derek Doran. EmojiNet: An Open Service and API for Emoji Sense Discovery. In 11th International AAAI Conference on Web and Social Media (ICWSM 2017). Montreal, Canada; 2017.
- [2] **Sanjaya Wijeratne**, Lakshika Balasuriya, Amit Sheth, Derek Doran. A Semantics-Based Measure of Emoji Similarity. In 2017 IEEE/WIC/ACM International Conference on Web Intelligence (Web Intelligence 2017). Leipzig, Germany; 2017.
- [3] Amit Sheth, Sujan Perera, **Sanjaya Wijeratne**, Krishnaprasad Thirunarayan. Knowledge will Propel Machine Understanding of Content: Extrapolating from Current Examples. In 2017 IEEE/WIC/ACM International Conference on Web Intelligence (Web Intelligence 2017). Leipzig, Germany; 2017.
- [4] **Sanjaya Wijeratne**, Lakshika Balasuriya, Amit Sheth, Derek Doran. EmojiNet: Building a Machine Readable Sense Inventory for Emoji. In 8th International Conference on Social Informatics (SocInfo 2016). Bellevue, WA, USA; 2016.
- [5] Lakshika Balasuriya, **Sanjaya Wijeratne**, Derek Doran, Amit Sheth. Finding Street Gang Members on Twitter, In The 2016 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2016). San Francisco, CA, USA; 2016.
- [6] **Sanjaya Wijeratne**, Derek Doran, Amit Sheth and Jack L. Dustin. Analyzing the Social Media Footprint of Street Gangs. 2015 IEEE International Conference on Intelligence and Security Informatics (ISI). IEEE, 2015.
- [7] **Sanjaya Wijeratne**, Bahareh R. Heravi, A Keyword Sense Disambiguation Based Approach for Noise Filtering in Twitter. The 1st Insight Student Conference, University College Dublin, Ireland, 2014.
- [8] Kalpa Gunaratna, Krishnaprasad Thirunarayan, Prateek Jain, Amit Sheth, **Sanjaya Wijeratne**, A Statistical and Schema Independent Approach for Identifying Equivalent Properties on Linked Data. In: Proc. 9th International Conference on Semantic Systems (ACM 2013), Messe Graz, Austria, 2013.

### Workshop Papers.....

- [1] **Sanjaya Wijeratne**, Lakshika Balasuriya, Derek Doran, Amit Sheth. Word Embeddings to Enhance Twitter Gang Member Profile Identification. In IJCAI Workshop on Semantic Machine Learning (SML 2016). New York City, NY: CEUR-WS; 2016.
- [2] Lakshika Balasuriya, **Sanjaya Wijeratne**, Derek Doran, Amit Sheth. Signals Revealing Street Gang Members on Twitter. In Workshop on Computational Approaches to Social Modeling (ChASM 2016) co-located with 8th International Conference on Social Informatics (SocInfo 2016). Bellevue, WA, USA;

- [3] Ajith Ranabahu, Amit Sheth, Maryam Panahiazar, **Sanjaya Wijeratne**, Semantic Annotation and Search for resources in the next Generation Web with SA-REST. W3C Workshop on Data and Services Integration, October 20-21 2011, Bedford, MA, USA.

## Posters.....

- [1] **Sanjaya Wijeratne**, Lakshika Balasuriya, Amit Sheth, Derek Doran. EmojiNet: A Machine Readable Emoji Sense Inventory. Wright Brother's Day, Wright State University. Dayton, Ohio, USA; 2016.
- [2] R. Daniulaityte, R. Carlson, F. Golroo, **S. Wijeratne**, E. Boyer, S. Martins, R. Nahhas, A. Sheth, "Time for dabs": Analyzing Twitter data on butane hash oil use. The College on Problems of Drug Dependence CPDD 2015, Phoenix, Arizona, June 13-18, 2015.

## Professional Activities and Services

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**Co-Editor** – Special Issue on Emoji Understanding for ACM Transactions in Social Computing

**Co-Organizer** – Emoji2019 Workshop at WWW 2019, Emoji2018 Workshop at ICWSM 2018

**Program Committee** – WWW Demo Track (2019, 2018), ICWSM (2019, 2018), Web Intelligence (2018), Emojicon (2018), SemEval@NAACL (2018), CENTRIC (2019, 2018, 2017), HUSO (2018), SML@IJCAI (2017), EB-ASONAM (2017)

**External Reviewer** – CHI (2019), WWW (2017, 2015), ICWSM (2017, 2015), LREV (2017), EKAW (2016, 2014), ISWC (2016), IJCAI (2016), IEEE BigData (2016), NLDB (2016), IJSWIS (2016), HICSS (2015), SAC (2015), Web Intelligence (2014, 2013), ESWC (2013)

## Grant Writing

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- **Project Safe Neighborhood:** Westwood Partnership to Prevent Juvenile Repeat Offenders (State funded, 2 Years) – **Status - Awarded, \$~500K**
- **eDrugTrends:** Trending: Social media analysis to monitor cannabis and synthetic cannabinoid use (NIH funded R01, 3 Years) – **Status - Awarded, \$~1.5M**
- **SyBz:** Catching the Synthetic Buzz through Innovative Epidemiologic Monitoring (NIH R01)
- **ReCODE:** Real-time Computational Optimization of Deterrence (Department of Defense)

## Computer Skills

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- Programming Languages – *Java*
- Scripting Languages – *Python, PHP, JavaScript*
- Semantic Web – *RDF/RDFS, OWL, SPARQL*
- Databases – *MySQL/Oracle, Cassandra (Basics)*
- Cloud Computing – *Hadoop/MapReduce (Basics), Storm (Basics)*

## References

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