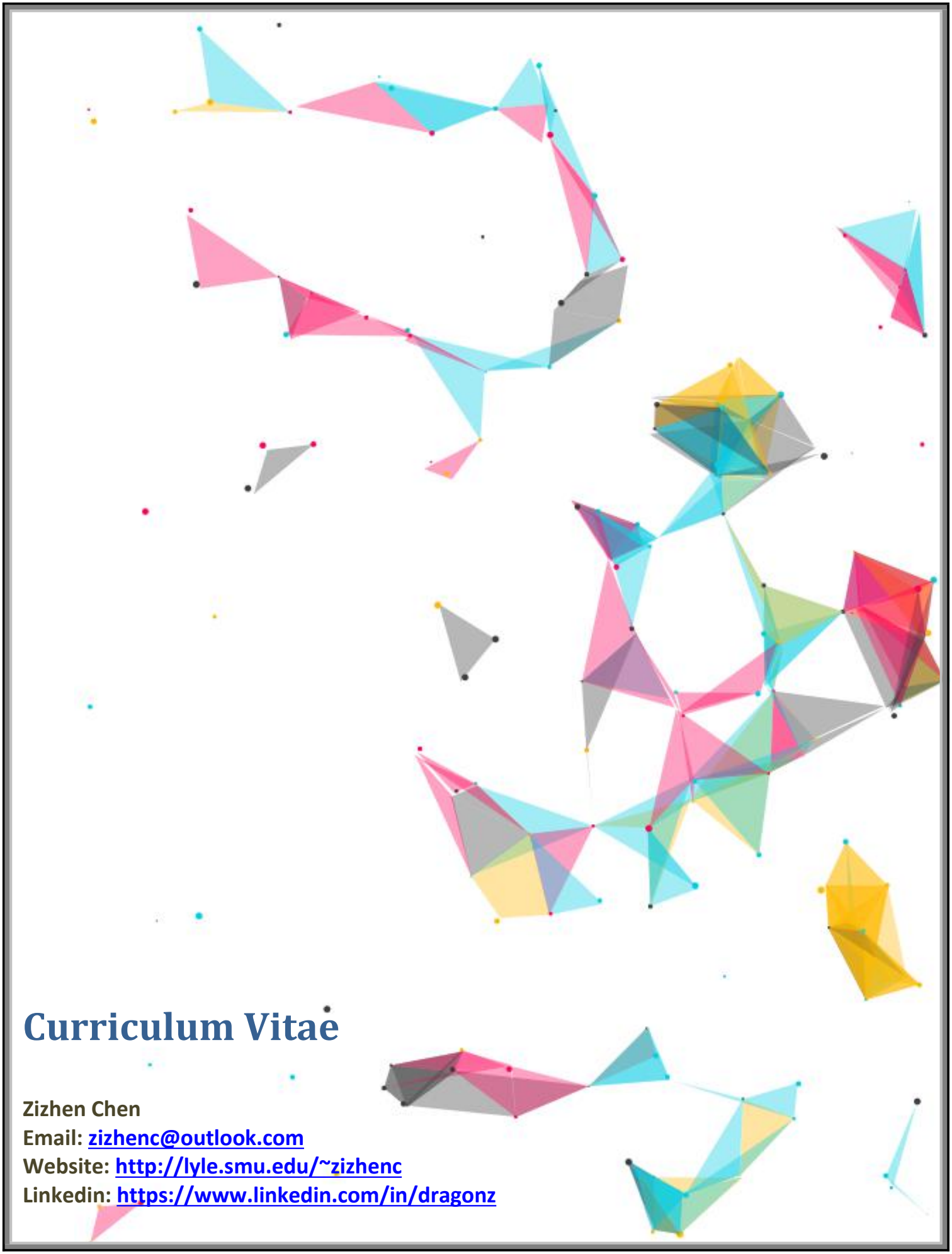

Curriculum Vitae

Zizhen Chen
Email: zizhenc@outlook.com
Website: http://lyle.smu.edu/~zizhenc
Linkedin: https://www.linkedin.com/in/dragonz

SUMMARY

I'm a Ph.D. student of Computer Science major at Southern Methodist University (SMU). I have more than 6 years' teaching experience in programming, algorithm and computer graphics in both the engineering school and the art school. My research interest lies in Visualized Algorithm Engineering, which focuses on partitioning problems in Graph Theory. This research has massive applications on clustering in big data area, community detection in social networks and data/algorithm visualizations in industry. I'm also experienced in User Interface Design, Software Engineering and Software Security.

EDUCATION

Southern Methodist University	Doctor of Philosophy, Computer Science	GPA: 3.922	Expected: May 2020
Southern Methodist University	Master of Science, Computer Science *Outstanding Graduate Student Award*	GPA: 3.911	Aug 2015
North China Electric Power University	Bachelor of Science, Software Engineering	GPA: 83/100	Jul 2010

TECHNICAL SKILLS

Programming: C/C++; Java; Javascript; Node.js; Processing; R; AMPL; SQL; Perl; HTML 5; JSON/XML; C#
Libraries (Most for Visualization): openFrameworks; P5.js; Jquery; Chart.js; d3.js
Developing Environments: Xcode, Visual Studio; JetBrains; Processing; Netbeans; Eclipse
Others: Computer Graphics, Algorithm Engineering, Data Mining, Machine Learning, Advanced Software Security, User Interface Design, File Organization and Database Management, Software Engineering

EXPERIENCES

The MathWorks, Inc. Natick, MA, U.S.
Senior Software Engineer 01/27/2020 - Present
- Enhance the core software infrastructure and design innovative algorithms, integrating the algorithms into code generation environment to improve the speed of the code generated by popular MathWorks products such as Embedded Coder. This will be used in applications and domains such as system control, signal processing, vision processing, and automated driving

o9 Solutions, Inc. Dallas, TX, U.S.
Senior Software Engineer 12/02/2019 - 01/08/2020
- Designed and developed enterprise software in area of supply chain management that involves application of Graph Theory, Algorithms and Operations Research techniques

Southern Methodist University, CS Department Dallas, TX, U.S.
Graduate Instructor & Grader 08/17/2019 - 12/20/2019
- Instructor of CS 5345: Advanced Application Programming class and grader of CS 7320: Artificial Intelligence class in Computer Science Department in Lyle School of Engineering

Southern Methodist University, CS & CC Department Dallas, TX, U.S.
Adjunct Faculty (On-Campus Job in Spring and Fall Semesters) 08/23/2016 - 05/31/2019
- Teach classes for both Computer Science Department in Lyle School of Engineering and Creative Computation Department in Meadows School of the Art, including:
    - CSE 1342: Programming Concepts (C++ Programming)
    - ASIM/CRCP 1310: Creative Coding I (Creative Coding in Processing Language)
    - ASIM/CRCP 3305: Creative Coding II (Creative Coding in C++ with openFrameworks library)
    - CSE 8355: Graph Theory: Algorithms and Applications (Applications on Graph Theory and Network Science)

Covansys Software Technology (Shanghai) Co., Ltd. Shanghai, China
Software Engineer 03/15/2011- 07/20/2011
- Handled IT tasks of our biggest client (Citibank); worked in the middle team connecting the front and back end of the bank system to improve the workflow
- Identified fraudulent ATM transactions and defended against the financial fraud threats
- Fixed, added and deleted ATM functional features to better serve the customers' needs

ACADEMIC PROJECTS & COMPETITION

Maximum Concurrent Flow Problem
- Designed visualization for a new clustering method based on network density and centrality for community detection in social networks

Wireless Sensor Network
- Built a 3D animation using Processing Language to describe a Wireless Sensor Network backbone determination process

SimpleScalar Testing
- Tested the influence of changing several CPU architectures by using SimpleScalar tool set

Work-hour Registration System Design
- Designed the user interface for a work-hour registration system

Minus Language Complier
- Built a complier called "C-Minus" in C++ for a simple C-like language

2014 Capital One National Data Mining Cup McLean, VA, U.S.

Top 5 among the 300+ university teams Nov 2014
- Presented the solution for "Optimal Search Engine AdWords Pricing" at the Capital One Corporate Headquarters

CONFERENCES & PRESENTATIONS

The 26th IEEE Symposium on Computer Arithmetic (Arith26) Kyoto, Japan
- Published paper "Precise and Concise Graphical Representation of the Natural Numbers" | Paper, Slides Jun 10 - 12, 2019

SIAM Workshops on Network Science (NS16; NS17; NS18) 2016, 2017, 2018
- Presented on "Partitioning Random Geometric Graphs into Bipartite Backbones" in NS16 workshop | Abstract, All programs Boston, MA, U.S.
- Presented on "The Evolution of Flow-Based Hierarchy in Networks" in NS17 workshop | Abstract, All programs Pittsburgh, PA, U.S.
- Presented on "Backbone Structure of Hierarchical Network Partitioning" in NS18 workshop | Abstract, All programs Portland, OR, U.S.

The 13th International Conference on Distributed Computing in Sensor Systems (DCOSS 2017) Ottawa, Ontario, Canada
- Presented on "Bipartite Grid Partitioning of a Random Geometric Graph" at University of Ottawa | Paper, Slides Jun 5 - 7, 2017

The 17th International Conference on Random Structures and Algorithms (RS&A 2015) | Program Pittsburgh, PA, U.S.
- Presented on "Bipartite Subgraphs of Random Geometric Graphs" at Carnegie Mellon University Jul 27 - 31, 2015

The Sixth SIAM Workshop on Combinatorial Scientific Computing (CSC14) Lyon, France
- Presented on "Partitioning Random Geometric Graphs's into Disjoint (1-ε) Dominant Bipartite Subgraphs" | Paper, Proceeding Jul 21 - 23, 2014

RESEARCH TOPICS

Bipartite Grid Partitioning of a Random Geometric Graph
We investigate into the problem of efficient computation of a partition of a Random Geometric Graph (RGG) into a limited number of densely packed bipartite grid subgraphs. The study focuses on the collection of subgraphs each individually having similar size and structure and the union employing most (e.g. over 85%) of the vertices. RGG's have been extensively employed in recent times to model the deployment of numerous instances of Wireless Sensor Networks (WSN's). The corresponding application of our research is determining backbones in WSN's.

Hierarchical Maximum Concurrent Flow Problem
We review the foundations of a hierarchical network partitioning method based on the fundamental concept of density (i.e., sparse cuts separating dense components) and implement the method via a duality to peer-to-peer network flow between all node pairs. This is a new clustering method in data mining especially for social networks.

Primordial Forest of Natural Numbers
In SIAM Review 10, page 273, my professor David W. Matula described a bijection between any natural number and the set of topological rooted trees; the number is called the Matula number of the rooted tree. By exploring the tree structure of Matula Number, we discovered a new relation of natural numbers which is a natural clustering of integers.

PUBLICATIONS

- David W. Matula., Zizhen Chen (2019). **Precise and Concise Graphical Representation of the Natural Numbers.** *The 26th IEEE Symposium on Computer Arithmetic*. Kyoto, Japan.
- Zizhen Chen, David W. Matula. (2018). **Backbone Structure of Hierarchical Network Partitioning.** *SIAM Workshop on Network Science 2018.* Portland, OR. U.S.
- Zizhen Chen, David W. Matula and Eli V. Olinick. (2017). **The Evolution of Flow-Based Hierarchy in Networks.** *SIAM Workshop on Network Science 2017.* Pittsburgh, PA, U.S.
- Zizhen Chen, David W. Matula. (2017). **Bipartite Grid Partitioning of a Random Geometric Graph.** *The 13th International Conference on Distributed Computing in Sensor Systems.* pp.163-169. Pittsburgh, PA, U.S.
- Zizhen Chen, David W. Matula. (2016). **Partitioning Random Geometric Graphs into Bipartite Backbones.** *SIAM Workshop on Network Science 2016.* Boston, MA, U.S.
- Zizhen Chen, David W. Matula. (2014). **Partitioning RGG's into Disjoint (1 − ε) Dominant Bipartite Subgraphs.** *The Sixth SIAM Workshop on Combinatorial Scientific Computing.* pp.48-50. Lyon, France.

HONORS

- Institute of Electrical and Electronics Engineers (IEEE) Student Membership 2017
- Southern Methodist University - Outstanding Graduate Student Award 2016
- Alpha Chi National College Honor Society Membership 2015
- Golden Key International Honor Society Membership 2014
- Society for Industrial and Applied Mathematics (SIAM) Student Membership 2014
- Southern Methodist University Altshuler Learning Enhancement Center (ALEC) - Excellence in Tutoring Award 2012