

# RUI ZHI

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## Education

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**North Carolina State University** Aug.2014 - Present  
Ph.D. in Computer Science GPA: 4.0/4.0 NC, USA

**Beijing University of Chemical Technology** Sept.2010 - July.2014  
B.E. in Computer Science GPA: 3.79/4.0 Ranked 1/126 Beijing, China

## Experience

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**Software Engineering Intern** *Google, Mountain View, CA, United States* May.2017 - Aug.2017  
- Attended team brainstorming sessions to explore student progression and homework ideas.  
- Created a web-based content authoring tool for creating and displaying multiple choice questions.  
*Skills: Java TypeScript Angular RxJS Spanner ProtoBuf HTML CSS*

**Teaching Assistant** Aug.2014 - Present  
*North Carolina State University, NC, United States*  
- TA'ed CSC 236 Computer Organization and Assembly Language and CSC 503 Computational Applied Logic.  
- Assisted with answering students' questions and providing hints to write assembly-language programs.  
- Grading assignments and exams.  
*Skills: x86 Assembly Language*

**Data Scientist Intern** May.2016 - Aug.2016  
*Hi Fidelity Genetics, NC, United States*  
- Led the design and implementation of a web platform for visualizing and analyzing environmental data.  
- Aggregated different datasets including NASS and GHCN by U.S counties.  
- Clustered and visualized virtual farms by weather pattern.  
- Implemented an algorithm for simulating weather variation of a farm to optimize field trials.  
*Skills: R Python Django PostgreSQL PostGIS AWS Leaflet JavaScript jQuery Bootstrap*

**Research Assistant** Sept.2013 - Jun.2014  
*Chinese Academy of Sciences, Beijing, China*  
- Assisted with the development of 3D faces reconstruction based on a morphable model.  
- Studied related algorithms such as Optical Flow,TPS, AAM, 3DMM.  
- Designed and implemented a system which can create 3D face automatically through a 2D face image.  
*Skills: MATLAB C++ OpenGL OpenCV*

## Projects

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**BOTS - An Educational Game for Teaching Programming** Oct.2015 - Present  
- Worked in a team of two to build debugging feature for the BOTS game.  
- Designed, implemented and tested the debugging feature.  
- Ran a pilot study to explore the debugging behaviors among 6-8th grade students.  
- Extracted code snapshots from interaction log data using Java.  
- Designed, implemented and tested new game tutorials with different support methods.  
- Being used in STARS outreach program for teaching middle school students programming.  
- Demo online: <http://bots.game2learn.com>  
*Skills: Unity3D JavaScript Java PHP MySQL*

**Git Helper Search Engine** Feb.2016 - May.2016

- Worked in a team of three to build a tailor-made search engine for git errors, search results are sorted based on tf-idf value of error message and Stack Overflow votes.
  - Crawled data related to git errors from Stack Overflow.
  - Implemented and tested the git helper search engine using Google App Engine.
- Skills: Python Google App Engine*

### **Building Netflix Prize Prediction Model**

Sept.2015 - Dec.2015

- Worked in a team of three to create prediction models using classification techniques including Decision Tree, SVM, ANN, KNN.
- Compared different prediction models based on Root Mean Square Error (RMSE).

*Skills: R MATLAB Java MySQL*

### **Guess It - A Spanish Words Learning Game**

Jan.2015 - May.2015

- Worked in a team of three with different majors to create an educational game to teach Spanish words.
- Designed, implemented and tested the game.
- Being used in Elementary Spanish course for online students as coursework.
- Demo online: <http://www4.ncsu.edu/~rzhi/GuessIt.html>

*Skills: Unity3D C#*

### **RobotArena - Game Artificial Intelligence**

Jan.2015 - May.2015

- Worked in a team of three to create an AI game, which focuses on decision making and strategies for virtual robots to compete in the arena, using decision tree, state machine, Dirichlet domain and A\* techniques.
- Implemented steering behaviors of virtual robots including attack, seek, evade, wander, etc.
- Wrote robot behaviors section of the documentation.
- Opensourced on GitHub.

- Demo video: <https://goo.gl/pbSojF>

*Skills: Java Processing API L<sup>A</sup>T<sub>E</sub>X*

### **Library Study Group Finder**

Sept.2014 - Dec.2014

- Worked in a team of four to create a web-based study group finder system.
- Designed the UI of the website along with HCI principles.
- Opensourced on GitHub.

*Skills: ASP.NET SQL Server Javascript CSS JQuery Bootstrap L<sup>A</sup>T<sub>E</sub>X*

### **Space Invader Game**

Sept.2014 - Dec.2014

- Implemented a 3D version space invader game.

*Skills: C++ OpenGL*

### **3D Face Reconstruction Based on a Single Image**

Sept.2013 - June.2014

- Studied related algorithms such as Optical Flow,TPS, AAM, 3DMM.
- Built a system which can create 3D face automatically through a 2D face image.

*Skills: MATLAB C++ OpenCV OpenGL*

### **Projectionist: Tracking Movie Play Record**

Apr.2014 - May.2014

- Worked in a team of two to create web application that helps local communities track movie play records.
- Opensourced on GitHub.

*Skills: HTML CSS Bootstrap PHP MySQL Javascript*

### **Tiny C Compiler Lexical Analysis and Semantic Analysis**

Mar.2013 - July.2013

- Implemented a Lexical Analyser by converting the regular expressions to minimized DFA.
- Implemented a Syntax Analyser for LL(1) and LR(0) grammar.

*Skills: Java C*

### **Digit-Recognition Based on Artificial Neural Network**

Mar.2013 - June.2013

- Built a predictor based on a 3-layer feed-forward neural network using the resilient backpropagation algorithm.

*Skills: Java*

## **Personalized Information Service Based on Web Data Extraction and Analysis** Apr.2012 - Apr.2013

Supported by *The National Undergraduate Scientific and Technological Innovation Fund*

- Researched algorithms such as Breadth-first and Best-first to get the best order to access URL.
- Wrote programs to collect web data extracted by the page path and save them in personalized file formats.

*Skills: HTML CSS Java*

## ***Awards and Honors***

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- Graduate Assistantship (\$42,000 Annually), *NCSU* 2014-Present
- Regional Software Developing Talent Competition Second Prize, *MIITEC*, 20% among 15,000 participants 2013
- Chinese National Scholarship, *Ministry of Education of China*, 0.5% Nationwide 2013
- Outstanding Student of the Year, *BUCT*, 3% of the grade 2011-2012 , 2012-2013
- National ITAT Programming Second Prize, *EMIC*, 3% among 140,000 participants 2013
- Chinese National Encouragement scholarship, *BUCT*, 3% of the grade 2010-2011 , 2011-2012
- ACM/ICPC Program Design Competition Second Prize, *BUCT*, 3% among 200 participants 2011
- First-class People's Scholarship, *BUCT*, 1% schoolwide 2010

## ***Outreach***

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### **STARS Computing Corps** 2015 - Present

- Volunteer (2015 - Present): Assisted with monthly middle school CS outreach programs, helped design the curricula to teach middle school students fundamental computer science concepts.

## ***Publications***

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- **Zhi, R.**, Lytle, N., & Price, T. W. (in press). Exploring Instructional Support in an Educational Game for K-12 Computing Education. In Proceedings of the 49th ACM Technical Symposium on Computer Science Education (SIGCSE 2018).
- Price, T., **Zhi, R.**, and Barnes, T. (2017) Evaluation of a Data-driven Feedback Algorithm for Open-ended Programming (EDM 2017).
- Price, T., **Zhi, R.**, and Barnes, T. (2017) Hint Generation Under Uncertainty: The Effect of Hint Quality on Help-Seeking Behavior (AIED 2017).
- Liu, Z., **Zhi, R.**, Hicks, A., & Barnes, T. (2017). Understanding problem solving behavior of 6?8 graders in a debugging game. *Computer Science Education*, 1-29.
- Hicks, A., Catete, V., **Zhi, R.**, Dong, Y., & Barnes, T. (2015, June). BOTS: Selecting Next-Steps from Player Traces in a Puzzle Game. In Proceedings of the Second International Workshop on Graph-Based Educational Data Mining (GEDM 2015). CEUR-WS.
- Hicks, A., Catete, V., **Zhi, R.**, Dong, Y., & Barnes, T. (2015) Applying "Deep Gamification" Principles to Improve Quality of User-Designed Levels. In Proceedings of the eleventh annual conference on Games+Learning+Society (GLS 11).