

Curriculum Vitae of Wenxiang Chen

Personal Information

Name: Wenxiang Chen
Nationality: Chinese (PRC)
Date of Birth: September 28, 1988

Contact

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Current Position

- *Undergraduate Member*, Nature Inspired Computation and Application Laboratory (NICAL)
- *Senior Undergraduate*, School of Computer Science and Technology

Research

Interests

- Evolutionary Computation
- Multi-objective Optimization
- Expensive Optimization Problems
- Large-Scale Numerical Optimization
- Massively Parallel Computing based on GPUs

Publications

Refereed Conference Papers

- **Wenxiang Chen**, Thomas Weise, Zhenyu Yang and Ke Tang.
Large-Scale Global Optimization using Cooperative Coevolution with Variable Interaction Learning.
In Proceedings of the 11th International Conference on Parallel Problem Solving from Nature (PPSN' 2010)
Krakow, Poland, 2010, Part II, pp.300-309, Lecture Notes in Computer Science, volume 6239, Springer
Link: <http://cs-chen.net/document.html>

Awards and Honors

October, 2009	Third-level Excellent Students Scholarship, USTC
October, 2008	Third-level Excellent Students Scholarship, USTC
December, 2008	Excellent grade in Undergraduate Research Programme, USTC
September, 2008	Leader of the team that won the Best Technical Award in the Robogame 2008, see projects list, Appendix A
September, 2007	First-level Scholarship for Excellent Freshman, USTC

Education

<i>Undergraduate</i>	Computer Science, University of Science and Technology of China.	2007.8 to 2011.7
<i>High School</i>	Quanzhou No.1 High School, Fujian Province, China.	2004.9 to 2007.6

Most Recent Score

- **Course Weighted Average Score:** 84.37/100¹. (September 1, 2010)

Skills

Computer Skills

- **Programming Languages**
Matlab, Java, C++, C, Bash, SQL, Assembly Language.
- **Operating Systems and Tools**
Linux, Windows, Vim, Latex, Eclipse, Codeblocks, JabRef, Inkscape, Corel Draw Suite, OpenOffice, Microsoft Office.

Other Skills

- team leadership, teamwork with international colleagues, communication, presentation, slides and poster design, sports (i.e. basketball, table tennis, running, etc).

Activities

2010.10	Assistance in the organization of IWNICA' 2010 , Hefei, China, as a volunteer
2010.9	Participation and presentation in PPSN' 2010 , Krakow, Poland
2008.8 to 2009.8	Chair of the association of the students who come from Quanzhou, Fujian Province

Languages

- **Chinese:** Mother tongue
- **English:** Fluent in both speaking and reading

Internet-based TOEFL² (May 16, 2010):

Reading	Listening	Speaking	Writing	Total
22	20	18	21	81

¹Score ranges from 0 to 100

²<http://en.wikipedia.org/wiki/TOEFL>, score for each section ranges from 0 to 30

Referees

- **Dr. -Ing. Thomas Weise**

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- **Prof. Ke Tang**

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- **Prof. Xin Yao**, Fellow of IEEE

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- **Dr. Alexandre Devert**

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References

Available upon request

Appendices

A. Selected Recent Projects

Several selected projects I have finished or which are now ongoing, classified into three categories:

1. Evolutionary Computation Related
2. GPU-based Parallel Computation Related
3. General Project

A. Selected Recent Projects

1. Evolutionary Computation Related Project

- | | |
|-------------------|--|
| 2010.8 to Present | <p><i>Study on the most state-of-the-art algorithms on large-scale global optimization</i>
 Supervisor: Dr.-Ing. Thomas Weise, Prof. Ke Tang
 Description:</p> <ul style="list-style-type: none"> • I started this project while assisting at the CEC Special Session on Large-Scale Global Optimization. I tracked the developing tendency of benchmark function sets proposed by the Special Session, a session where different numerical optimization algorithms are compared based on benchmarks for large-scale problems. Based on a study of the benchmark functions used in the special session, I am developing a more general benchmark model which is even closer to real-world numerical problems. • I took a deep look at the contributions from the competition participants. Based on this study, I am extending our CCVIL algorithm (published at PPSN). |
| 2010.7 to 2010.8 | <p><i>Study on Epistasis, Linkage and the NK landscape</i>
 Supervisor: Dr.-Ing. Thomas Weise
 Description:</p> <ul style="list-style-type: none"> • I am conducting a comprehensive study on Epistasis, Linkage, Separability and the NK landscape. Epistasis is the phenomenon that the effects of one gene can be modified by one or several other genes. Linkage is used to demonstrate the interdependence between several genes in binary solution representations used in optimization algorithms. The NK-landscape is a tunable model for simulating different degrees of epistasis. • In order to manage the reference papers, I set up a bibliography database with the assistance of JabRef. Since each reference paper is a BibTex entry, I export my database on the website (http://mail.ustc.edu.cn/~chenwx/bib.html) and synchronise it frequently. |
| 2010.3 to 2010.4 | <p><i>Exploration on Variable Learning Mechanism in Cooperative Coevolution (CC)</i>
 Supervisor: Dr. Zhenyu Yang, Dr.-Ing. Thomas Weise, Prof. Ke Tang
 Description: Motivated by the study on (r)JADE, a variant of Differential Evolution (DE), I embedded a Variable Interaction Learning (VIL) mechanism into Cooperative Coevolution. After a long period of theoretical analysis and experimental study, I found an applicable approach for combining between CC and VIL. This work is published as academic paper, and presented at PPSN'2010.</p> |
| 2010.1 to 2010.2 | <p><i>Study on JADE and its variant rJADE</i>
 Supervisor: Fei Peng, Dr. Zhenyu Yang
 Description: I conducted a study and assessed the scalability of JADE and rJADE when the dimensions of problems scale up to 1000. It turned out that (r)JADE works well in non-separable functions, but performs relatively poor in separable function, due to the slow convergence speed.</p> |

2. GPU-based parallel computation Related

2009.7 to 2008.8

GPU Computing with CUDA

Supervisor: Prof. Ke Tang

Description: CUDA (Compute Unified Device Architecture) is a parallel computing architecture developed by NVIDIA. In this project, I configured the development environment, implemented several fundamental algorithms and ran systematic experiments. The main focus of my study is:

- To measure the runtime of the different parallel implementations of a certain sequential algorithm, capture the rule of suitable parallelizing approach
- To compare the scalability of both the sequential and the parallel algorithms

It turned out that GPUs are powerful on computing-intensive tasks and large-scale problems.

3. General Projects

2010.6 to 2010.7

Implementation of a JAVA-like compiler's back-end

Supervisor: Prof. Yiyun Chen

Description: For the course “Compiler Techniques”, I implemented the back-end, i.e., the module that translates the intermediate representation into executable assembly code, of a JAVA-like high-level language compiler. This software cooperated with the front-end, i.e., the module that interprets the given high-level language to the intermediate representation, developed one of my classmates and together we constructed a complete compiler.

2010.5 to 2010.6

Implementation of Simple SQL database language

Supervisor: Prof. Lihua Yue

Description: In the course named “Introduction to Database System”, I implemented a prototype of the database manipulating language, as a subset of SQL used in the MySQL DBMS. The prototype includes the following features:

- Create table command
- Load table command, which is used for displaying all contents in the table.
- User-defined integrity constraint support
- Basic grammar checking and error reporting
- Delete, Add and Update operation support

2010.2 to 2010.3

Solving binary classification problems with Neural Networks, an empirical study on the impact of the different configurations

Supervisor: Prof. Enhong Chen

Description: With the assistance of MATLAB, I analysed the impact of different parameter configurations and various algorithms on the performance in binary classification problems. Finally, I employed the AUC (Area Under the Curve) metric to evaluate and analyse the outcome of each combination of configurations.

2009.11 to 2009.12 *Empirical Study on the Fastest Approach to find one feasible solution of the N-Queen Problem*

Supervisor: Prof. Enhong Chen

Description: In this course project, I implemented eight distinct approaches to find one feasible solution for the N-queen problem. There are two aspects that I explored in this project:

- Which (category of) approach is the fastest for the given problem?
- What happens if the size of the problem scales up?

2008.7 to 2008.9 *Robogame 2008 Competition*

Supervisor: Prof. Hui Li

Description: I led a team of four freshmen to take part in the Robogame 2008, where most participants are second-year students. The main goal of the competition was to design and implement a fighting robot. The project can be roughly divided into three parts: programming, mechanics and circuits. I was responsible for the programming and played a lead role in mechanical design. We employed the ATMEL MEGA16/32 as the central controller chip and programmed the robot in C. We won the only *Best Technical Award*. As a result of this award, I received an A+ in the “Undergraduate Research Programme”.