Wei Pan

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EDUCATIONAL BACKGROUND

Sep 2008- present	M.S. in Biomedical Engineering.	**GPA: 88.2/100**
	University of Science and Technology of China (USTC), Hefei, Anhui, China.	
Sep 2004- Jul 2008	B.E. in Automation.	**GPA: 87.3/100, Major GPA: 91/100**
	Harbin Institute of Technology (HIT), Harbin, Heilongjiang, China.	

SUMMARY OF TECHNICAL QUALIFICATIONS

- **Laboratory Skills**: PCR, gel electrophoresis, ligation and transformation of DNA into *E.coli* strains, culturing *E. coli*, DNA extraction and purification
- **Modeling**: State space model, nonlinear ordinary differential equations, stochastic differential equations
- **Analysis**: Linear Matrix Inequality, time-delay systems, switched systems, Lyapunov-Krasovskii functional theory, filter design, neural network analysis, system identification, sensitivity analysis
- **Computer Languages & Programs**: Matlab, C, C++, SBML, LaTex

PROFESSIONAL ACTIVITIES

- Reviewer for the following international journals and conference:
  Neurocomputing, Asian Journal of Control, Journal of Computational Biology, International Journal of Systems Science, IEEE Transactions on Systems, Man, and Cybernetics—Part B: Cybernetics, IEEE Control Systems Society Conference Management System.
- Volunteer, The Third International Symposium on Systems and Control in Aeronautics and Astronautics.
- Participant, Summer school on "Emergent Behaviour of Biomolecular Ensembles and Networks", Kavli Institute for Theoretical Physics China, Chinese Academy of Sciences (KITPC), with *Travel Awards*.
- Participant, Summer school on "Information Processes in Biological Systems", Peking University.
- Participant, CAS-MPG the First Exploratory Round Table Conference on Synthetic Biology, Shanghai Institute of Biological Sciences, Chinese Academy of Science.

TEACHING EXPERIENCE

Mar 2010 –Nov 2010	Instructor for the international Genetically Engineered Machine competition (iGEM), USTC_Software team, USTC, with ***Gold Medal*** and ***Best Software Tool***.
Feb 2010	Coach for three undergraduate students, Mathematical Contest in Modeling (MCM) with ***Honorable Award***.
Mar 2009 – Jul 2009	Teaching assistant for Biochemistry, School of Life Sciences, USTC.
Dec 2008 – Nov 2009	Team leader for the international Genetically Engineered Machine competition (iGEM), USTC_Software team, USTC, with ***Gold Medal***.

RESEARCH EXPERIENCE

Institute of Computational Biology, Chinese Academy of Sciences Dec 2009 – Dec 2010
Joint Education Graduate Student *Advisor*: Prof. Xinguang Zhu

Project 1: Applied hybrid optimization algorithm to estimate enzymes' maximum rate in photosynthetic metabolite network under different experiment protocols[10].

Project 2: Analyze the robustness and adaptation mechanism of photosynthetic metabolite network in response to varying irradiance intensity and CO_2 concentration.

University of Science and Technology of China Sep 2009 - present

Graduate Independent Researcher

Project: Robust Control of Gene Circuit (Funding Agency: USTC Graduate School)

- Analyzed robust stability of genetic regulatory network with stochastic and structural uncertainties [5].
- Designed a robust genetic circuit by applying a mixed H_∞ theory and Integral Quadratic Constraints (IQC) approach[6]. (Collaboration with Cambridge University, Control Group).
- Designed a nonlinear feedback gene circuit to attenuate noise in gene expression by automatically tuning strengthen of promoters[7].

University of Science and Technology of China Dec 2008 - Nov 2009

Team Leader for iGEM USTC_Software Team

Project: Automatic Biological Circuit Design [8]

- Initiated and lead the first software team, conceived the whole project.
- Developed system identification methods to search topology and kinetic parameters of biological circuit.
- Applied local and global sensitivity analysis method to design robust biological circuit.
- Wrote the Wiki and maintained the website http://2009.igem.org/Team:USTC_Software.

University of Science and Technology of China Sep 2008 – Dec 2008

Graduate Research Assistant *Advisor*: Prof. Huanqing Feng

Project: Research on computer-aided diagnosis system for brain tumors and cerebral hemorrhage

- Studied pattern recognition technique and image processing algorithm.
- Implemented meanshift algorithm in C++.

Harbin Institute of Technology Sep 2007 - Jul 2008

Undergraduate Independent Researcher *Advisor*: Prof. Huijun Gao

Project 1: Multistability of Genetic Regulatory Networks (GRNs)

- Applied switched system theory and multiple Lyapunov functions to investigate multistability of GRNs [1].
- Analyzed monostability and multistability in a uniform framework of nonlinear GRNs with time delay [2].
- Analyzed multistability of genetic regulatory networks with multivariable regulation functions[3].

Project 2: Analyzed robust stability of stochastic genetic regulatory networks considering both intrinsic and extrinsic noises to model the uncertainty and fluctuation of kinetic parameters and time delays[9].

Project 3: Designed robust synthetic gene circuits to attenuate the noise in GRNs using H_∞ control theory [4].

PUBLICATIONS

Journal Papers

[1]. **Wei Pan***, Zexu Zhang and Hongyang Liu, "Multistability of Genetic Regulatory Networks", ***International Journal of Systems Science***. Vol.41, No. 1, Jan. 2010, pp.107-118. (Corresponding author)

[2]. **Wei Pan**, Zidong Wang and Huijun Gao, "Monostability and Multistability of Genetic Regulatory Networks with Different Types of Regulation Functions". ***Nonlinear Analysis: Real World Applications***. Vol. 11, No. 4, Aug. 2010, pp. 3170-3185.

[3]. **Wei Pan,** Zidong Wang, Huijun Gao, Yurong Li and Ming Du, "On Multistability of Delayed Genetic Regulatory Networks with Multivariable Regulation Functions". ***Mathematical Biosciences***. Vol. 228, No. 1,

Nov. 2010, pp. 100-109.

[4]. **Wei Pan**, Zidong Wang, Huijun Gao, Yurong Li and Ming Du, "Robust H_∞ Feedback Control for Uncertain Stochastic Delayed Genetic Regulatory Networks with Additive and Multiplicative Noise", ***International Journal of Robust and Nonlinear Control***. Vol. 20, No 18, Dec. 2010, pp. 2093–2107.

[5]. **Wei Pan**, Zidong Wang and Jun Hu, "Robust Stability of Delayed Genetic Regulatory Networks with Different Sources of Uncertainties", ***Asian Journal of Control***. (In Press)

[6]. Xiaochuan Yuan, Ye Yuan, **Wei Pan** and James Lam, "Robust Genetic Circuit Design: A Mixed H_∞ and IQC Analysis", ***Asian Journal of Control***. (In Press)

[7]. **Wei Pan**, Zidong Wang and Jun Hu, "Noise Attenuation in Gene Circuit: A Nonlinear Feedback Control Strategy ". (In Preparation)

Conference Papers & Poster

[8]. **Wei Pan**, Yuwei Cui, Yu He, Jiahao Li, Xiaomo Yao, Bo Ding, "ABCD: Automatic Biological Circuit Design Software Package". ***Poster on the International Genetically Engineered Machine Competition, M.I.T, Boston, Nov 3, 2009.***

[9]. **Wei Pan**, Zidong Wang, Jun Hu and Huijun Gao, "Robust Stability of Genetic Regulatory Networks with Stochastic Time Delays Under Intrinsic and Extrinsic Noise". ***The 29th Chinese Control Conference, Beijing, July, 2010.***

[10]. **Wei Pan**, John Fettig, Eric de Sturler, Xinguang Zhu, "Impacts of Different Metabolite Measurement Protocols on Estimating Parameters in Complex Kinetic Metabolism Models", ***The 4th International Conference on Computational Systems Biology, Suzhou, September, 2010.***

REFERENCES

Huijun Gao, Ph.D, **Professor**

Undergraduate adviser

Department of Control Science and Engineering, Space Control and Inertial Technology Research Center, Harbin Institute of Technology, P.R.China.

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Master graduate adviser

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Zidong Wang, Ph.D, Professor

Research supervisor and collaborator

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