

基本信息 ▾

姓名/单位/学科/研究方向



**宋宏** 博士  
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相关教师



李楠  
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沈永行  
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钱骏  
光学工程

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欢迎光临浙江大学海洋学院宋宏的个人主页！

宋宏，博士，副教授，浙大求是青年学者，硕士生导师，海洋光电与自动控制实验室负责人。祖籍江苏靖江，现工作于浙江大学 海洋学院 海洋工程学系 海洋工程与技术研究所。

欢迎 海洋/光电/机电/计算机/自动控制（自动化）等专业的本科/硕士/博士研究生 参与实验室科研！

欢迎国内外研究同行、校内外学生与我联系探讨！

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Welcome to the homepage of Dr. Hong Song, Associate Professor, Institute of Ocean Engineering and Technology, Ocean College, Zhejiang University! Awarded Distinguished Young Scholar of Zhejiang Univ. (also called Qiushi Young Scholar) in 2012. If you are interested in my research topics or should you have any question or suggestion, please feel free to let me know.

Note : Looking for international students with background on Opto-Electronics, Mechatronics and Control !

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\*\*\*\*\* I. 研究领域 (Research Interest) \*\*\*\*\*

目前主要研究领域包括：

- 1、智能水下光电测量、成像、图像处理
- 2、自适应光学系统的控制和图像处理技术

My main research interest includes:

- 1. Intelligent Underwater Optical Measurement and Imaging
- 2. Modeling and Control of Adaptive Optics Systems, Image processing in AO systems

\*\*\*\* II. 学习及工作经历 (Education/Research Experience) \*\*\*\*

Lecturer/Associate professor in Ocean College, Zhejiang University 2011/17 – now

Focus: Underwater Optics / Modeling and Control for Adaptive Optics Systems

Post-doc in Systems and Control 2010- 2011

School: Delft Center for Systems and Control (DCSC), TU Delft, The Netherlands ( 荷兰代尔夫特理工大学 系统与控制中心 )

Dr. R. Oldenbeuving, Dr. C. Lee, Dr. H. Offerhaus and Prof. Dr. K. Boller ( Twente University)

Ph.D. in Systems and Control 2006- 2009

School: Delft Center for Systems and Control (DCSC), TU Delft, The Netherlands ( 荷兰代尔夫特理工大学 系统与控制中心 )

Focus: Adaptive Optics ( 自适应光学 ), Hysteresis Compensation ( 滞回补偿 ), System Identification ( 系统辨识 ), Model-based Optimal Control ( 基于模型的优化控制器设计 )

Project: Control of Large Scale Adaptive Optics Systems

Thesis: Model-based Control in Adaptive Optics Systems

Supervisors: Prof. Dr. Michel Verhaegen, Dr. Gleb Vdovin, Dr. Rufus Fraanje, Prof. Dr. Georg Schitter

M.Sc. in Microelectronics (Cum laude) 2003 - 2005

School: Microelectronics, Delft University of Technology (TU Delft), The Netherlands ( 荷兰代尔夫特理工大学 微电子系 )

Focus: Adaptive Optics, MEMS technology

Thesis: Piezoelectric Deformable Mirror with Multiplexing Control

Supervisors : Dr. Gleb Vdovin, Dr. Aleksey Simonov

M.Sc. in Microelectronics 2002 - 2005

School: Microelectronics, Fudan University, Shanghai, P.R.China ( 复旦大学微电子学系 )

Focus: Adaptive Optics, MEMS technology

Thesis: Piezoelectric Deformable Mirror with Multiplexing Control

Supervisors: Prof. HUANG Yi-ping ( 黄宜平教授 ), Prof. ZHOU Jia ( 周嘉教授 )

B.Sc. in Lighting Source and Illuminating Engineering 1998 - 2002

School: Lighting Source and Illumination, Fudan University, Shanghai, P.R.China ( 复旦大学光源与照明工程系 )

Supervisors: Prof. ZHANG Shan-duan ( 张善端教授 ), Prof. LIU Mu-qing ( 刘木青 教授 )

\*\*\*\*\* III. 著作和论文 ( Publications ) \*\*\*\*\*

著作(BOOK) :

陈鹰、瞿逢重、宋宏、黄豪彩, 《海洋技术教程》, 浙江大学出版社, 51万字, 2012。

Marine Technology, Ying Chen, Fengzhong Qu, Hong Song, Haocai Huang, Zhejiang University Presss, 2012. (Chapter 4.5,11, in Chinese)

期刊论文(Journal papers) :

1. Y. Guo, H. Song\*, H. Liu, et.al, "Model-based restoration of underwater spectral images captured with narrowband filters," Opt. Express 24, 13101-13120 (2016).

2. P. Yang, H. Song\*, L. Lou, T. Liu, J. Zhang, H. Wang, S. Zhan, H. Huang, Q. Mu, W. Yang, Comparison on wavefront aberration correction for laser beam propagating over saline water and sands, Infrared and Laser Engineering, 45(4), 0432001(1-7), 2016.

3. H. Song, J. Zhang\*, et al., Dynamic modeling of an input-output coupled piezoelectric fast steering mirror, Infrared and Laser Engineering, 45(3): 0318002(1-6), 2016.

4. S. Zhan, C. Shi, H. Ou, H. Song\*, X. Wang, A real-time de-noising method applied for transient and weak biomolecular interaction analysis in surface plasmon resonance biosensing, Measurement Science and Technology, 27(3), 035702, 2016.

5. H. Liu, P. Yang, H. Song\*, et.al, Generalized weighted ratio method for accurate turbidity measurement over a wide range, OPTICS EXPRESS, 23(25):32703-32717, 2015.

6. F. Qu, Z. Wang, H. Song\*, Y. Chen, L. Yang, A study on a cabled seafloor observatory, IEEE INTELLIGENT SYSTEMS, 30(1):66-69, 2015.

7. H. Wang, H. Song, Y. Chen, et al., "Correcting temperature dependence in miniature spectrometers used in cold polar environments," Applied Optics, 2015, 54(11):3162-3172.

estimation method for integrated optics," *Opt.Express* 21, 17042-17052,2013.

10. R. M. Oldenbeuving\*, E. J. Klein, H. L. Offerhaus, C. J. Lee, H. Song and K.-J. Boller, "25 kHz narrow spectral bandwidth of a wavelength tunable diode laser with a short waveguide-based external cavity", *Laser Phys. Lett.* 10, 015804, 2013.

11. 王冲冲, 胡立发, 何斌, 穆全全, 曹召良, 宋宏, 等. "基于神经网络的压电倾斜镜磁滞补偿方法研究", 《中国激光》, 2013(11): 239-244.

12. H. Song\*, R. Fraanje, G. Schitter, G. Vdovin and M. Verhaegen, "Model-based control in a high-sampling-rate closed-loop adaptive optics system with piezo-driven deformable mirror", *European Journal of Control* 17 (3), 290-301, 2011.

13. H. Song\*, R. Fraanje, G. Schitter, H. Kroese, G. Vdovin and M. Verhaegen, "Model-based aberration correction in a wavefront-sensor-less adaptive optics system". *Optics Express* 18 (23), 24070-24084 (2010).

14. H. Song\*, G. Vdovin, R. Fraanje, G. Schitter, and M. Verhaegen, "Extracting hysteresis from nonlinear measurement of wavefront-sensorless adaptive optics system", *Opt. Lett.* 34, 61-63 (2009).

15. 杨萍\*, 廖宁放, 宋宏, "基于彩色数字相机的光谱反射率重建方法研究", 《光谱学与光谱分析》, 29 (5), 1176-1180, 2009.

16. A. Simonov\*, H. Song, G. Vdovin, "Piezo deformable mirror with adaptive multiplexing control", *Optical Engineering* 45(07), 2006.

17. 宋宏, 周嘉, 黄宜平\*, "使用多路复用技术控制可变形反射镜", 《复旦学报》(自然科学版), 2006年第4期, 2006.

#### 会议论文(Conference papers):

1. Y. Guo, H. Liu, Y. Chen, W. Riaz, P. Yang, H. Song\*, Y. Shen, S. Zhan, H. Huang, H. Wang, M. Fang and J. Leng, "Color restoration method for underwater objects based on multispectral images", *OCEANS'16 MTS/IEEE*, 2016, Shanghai, CN, 2016.4.10-4.13.

2. T. Liu, J. Zhang, W. Riaz, P. Yang, H. Wang, Q. Mu, Y. Cai, M. Fang and H. Song\*, "Comparison on Zernike coefficients of wavefront aberration in laser beam propagating over heated sands and saline water", *OCEANS'16 MTS/IEEE*, 2016, Shanghai, CN, 2016.04.10-04.13.

3. Y. Chen, Y. Guo, W. Riaz, H. Wei, H. Wang, P. Yang, H. Huang, S. Zhan, M. Fang, and H. Song\*, "Optimal selection of underwater multispectral images for accurate compensation of water attenuation", *OCEANS'16 MTS/IEEE*, 2016, Shanghai, CN, 2016.4.10-4.13

4. H. Liu, H. Song\*, S. Zhan, H. Huang, H. Wang, J. Xu, and Y. Chen, "Selection of multi-angle combination in precise turbidity measurement", *OCEANS'15 MTS/IEEE*, 2015, Washington, USA, 2015.10.19-10.22

5. Y. Shen, H. Huang, H. Song, and S. Zhan, "Preliminary study of determination of Dinophysis concentration using hyperspectral imaging", *OCEANS'15 MTS/IEEE*, 2015, Washington, USA, 2015.10.19-10.22.

6. S. Zhu, H. Song\*, P. Yang, J. Xu, F. Qu, H. Huang, H. Ge, J. Han, and J. Leng, "Measurement of wavefront aberration in laser beam propagating over water", *OCEANS'14 MTS/IEEE*, 2014, Taipei, China, 2014.04.07-04.10

7. S. Zhu, H. Song\*, P. Yang, Q. Mu, F. Qu, H. Huang, H. Ge, J. Han, J. Leng, Y. Cai, Y. Chen, "Characterization of wavefront aberration in laser beam propagating over saline water and sands", *Oceans'13 MTS/IEEE*, 23-26 Oct. 2013, San Diego, USA, 2013.

8. R. Lan, Y. Yue, H. Song, F. Qu, D. Song, Y. Xie, Y. Cai, Y. Chen\*, "Development of a scientific instrument interface module for cabled seafloor observatories based on industrial control technology", *Oceans'13 MTS/IEEE*, 23-26 Oct. 2013, San Diego, USA, 2013.

9. S. Zhu, H. Song\*, P. Yang, H. Liu, R. Lan, Y. Liu, H. Huang, F. Qu, J. Leng, Y. Chen, "Wavefront Aberration Characterization and Correction for Laser Beam Propagating over Saline Water and Sands", invited paper, 2013 IFAC Symposium on Mechatronic Systems, Hangzhou, 10-12 Apr., 2013.

10. L. Chen\*, Q. Xu, M. Wu, J. Hu, H. Song, H. Yang, J. Han and Y. Chen, "Corrosion monitoring for marine concrete based on a first-order RC model". *Oceans'12 MTS/IEEE*, 14-19 Oct. 2012, pp. 1-6, Virginia, USA, 2012.

propagating over water with a closed-loop adaptive optical system", Oceans'12 MTS/IEEE, 21-24 May, pp.1-4, Yeosu, Korea, 2012.

13. J. Antonello\*, R. Fraanje, H. Song, M. Verhaegen, H. Gerritsen, C. U. Keller and T. van Werkhoven, "Data driven identification and aberration correction for model-based sensorless adaptive optics", Proc. SPIE 8436, Optics, Photonics, and Digital Technologies for Multimedia Applications II , 16 Apr., pp.84360S-1, Brussel, Belgium, 2012. <http://dx.doi.org/10.1117/12.922002>

14. H. Song\*, R. Fraanje , G. Schitter , G. Vdovin and M. Verhaegen , "Modeling and control of a nonlinear dynamic adaptive optics system" , invited paper, 2010 IFAC Symposium on Mechatronic Systems , Boston , 13-15 Sep. , 2010.

15. H. Song\* , R. Fraanje , G. Schitter , G. Vdovin and M. Verhaegen , "Hysteresis compensation in a wavefront-sensor-less adaptive optics system" , presented in the Seventh International Workshop on Adaptive Optics for Industry and Medicine , Moscow , 2009.

16. H. Song\* , R. Fraanje , G. Schitter , G. Vdovin and M. Verhaegen , "Hysteresis compensation for a piezo deformable mirror" , in Proceedings of the Sixth International Workshop on Adaptive Optics for Industry and Medicine , pages 112-117 , Ireland , 2007.

17. H. Song\* , A. Simonov, G. Vdovin , "Multiplexing control of a multichannel piezo deformable mirror" , Proc. SPIE Vol. 6018 , p. 154-163 , 2005.

18. G. Vdovin\* , M. Loktev , A. Simonov , H. Song , "Subjective adaptive correction of the aberrations of the human eye" , Proc. SPIE Vol. 5823 , p. 154-163 , 2005.

\*\*\*\*\* IV. Others \*\*\*\*\*

下列协会的会员 ( Membership ) :

- I IEEE Oceanic Engineering Society (OES)
- I Optical Society of America (OSA)
- I Oceanography Society
- I Marintime Technology Society
- I 中国光学工程学会
- I 中国光学学会

曾为下列杂志审稿 ( Reviewers for ) :

- I Optics Letters
- I Optics Express
- I Applied Optics
- I Automatica
- I Control Engineering Practice
- I Mechatronics
- I Chinese Optics Letters
- I 《红外与激光工程》 (Infrared and Laser Engineering)
- I 《光学学报》 (Acta Optica Sinica)
- I 《中国激光》 (Chinese Journal of Lasers)

平时喜欢文体运动, 如篮球、羽毛球、跑步、健身、吉他等, 对篮球尤其热衷。

Enjoy basketball, badminton, keep-fitting, jogging, guitar in my spare time!

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