Name (Surname, First Name)	Jianzhong HAO, Emily	
Designation/Former Appointment	Senior Scientist III, Head of Infrastructure & Asset Integrity Unit, Institute for Infocomm Research (I^2R), Agency for Science, Technology and Research (A*STAR), Singapore	
Email	haoemily@i2r.a-star.edu.sg	

Education

(Descending chronological order, with most recent on top)

Year of Attainment	Qualification and Area of Study	Institute
2001	Ph.D (Electrical and Electronic Engineering) Thesis: Design and fabrication of fiber optic pressure sensor	Nanyang Technological University, Singapore
1993	M.Eng (Electronic and Information Engineering, Millimetre Wave Technology) Thesis: Design and development of a 35GHz Gunn's diode power combiner	Huazhong University of Science & Technology (HUST), China
1990	B.Eng Hons (Electronic and Information Engineering, Microwave Technology)	HUST, China

Working Experience

(Descending chronological order, with most recent on top)

Period	Job Title and Research Areas	Organisation
01-07-2002 to present	Senior Scientist III, Fiber optic sensors	Institute for Infocomm Research (I^2R), Singapore
01-01-2000 to 30-06-2002	Optical components D&D (Isolator, WDM, EDFA, etc)	Fujikura Ltd.Japan and Fujikura Technology, Singapore
01-06-1996 to 30-11-1996	Application Engineer, Product development and software programming	Excel-Max Communications Pte Ltd, Singapore
01-05-1995 to 31-05-1996	Technical Support Engineer, RF / Microwave / Optical products	Hi-Tech Business Associates Pte Ltd, Singapore
01-06-1993 to 30-04-1995	Design Engineer, Designed optical communication trunk and lateral transmission lines	Yangtze Optical Fiber Communication and Industrial Group, China

Awards

(Descending chronological order, with most recent on top)

Year of Award	Award Title and Description	Awarding Organisation
2018	A*STAR Aerospace Programme Achievement Award	A*STAR & Airbus
2014	FY13 Role Model	I^2R
2013	ASEAN Outstanding Engineering Achievement Award	IES (The Institution of Engineers)
2013	IES Prestigious Engineering Achievement Awards, Singapore (under Technology Innovation Category)	IES
2011	I2R Achiever of the year (under development category), for the Innovative Design and Implementation of a Novel Perimeter Fence Intrusion Detection System	I^2R
1996-1999	PhD Research Scholarship from Nanyang Technological University (NTU)	NTU

1990-1993	M. Eng. Research Scholarship	HUST
1986-1990	Merit student, Outstanding student leader	HUST

Competency Area

Fiber optic sensors and applications, Sensor packaging, Structural Health Monitoring, Predictive Maintenance, Bio-photonics, System integration.

Selected Publications

(Descending Chronological Order, with most recent on top)

Date of Publication	Publication Title and Description	Impact Factor	Total Citation
2020	Madan, A.; Yap, S.H.K.; Paulose, V.; Chang, W.; Shum, P.P.; Hao, J. Investigation of a Bragg Grating-Based Fabry–Perot Structure Inscribed Using Femtosecond Laser Micromachining in an Adiabatic Fiber Taper. *Appl. Sci.* **2020**, *10*, 1069. https://doi.org/10.3390/app10031069	2.838	7
2020	W. Lai et al., "Force Sensing With 1 mm Fiber Bragg Gratings for Flexible Endoscopic Surgical Robots", IEEE/ASME Transactions on Mechatronics, vol. 25, no. 1, pp. 371-382, Feb. 2020, doi: 10.1109/TMECH.2019.2951540	5.867	30
2020	W. Lai et al., "Force Sensing With 1 mm Fiber Bragg Gratings for Flexible Endoscopic Surgical Robots", IEEE/ASME Transactions on Mechatronics, vol. 25, no. 1, pp. 371-382, Feb. 2020, doi:10.1109/TMECH.2019.2951540.	5.303	37
2018	Wen Chen, Jianzhong Hao, Ming Tang, “Improved estimate and accurate measurement of thermal stresses in FRP tendon”, Construction and Building Materials, Volume 164, 2018, Pages 620-624, ISSN 0950-0618, https://doi.org/10.1016/j.conbuildmat.2017.12.151.	7.693	4
2017	Chen, Wen, Jianzhong Hao, and Ming Tang. “Analytical Analysis of Dynamic Stress Distribution of Fiber Reinforced Polymer Rod Based on Realistic Boundary Shear Stress.” Composites Part B: Engineering, Volume 131, 2017, Pages 209-220, ISSN 1359-8368, https://doi.org/10.1016/j.compositesb.2017.07.043.	11.322	5
2012	Bo Dong, Jianzhong Hao, Taishi Zhang, Jun Long Lim, “High sensitive fiber-optic liquid refractive index tip sensor based on a simple inline hollow glass micro-sphere”, Sensors and Actuators B: Chemical, Volumes 171–172, 2012, Pages 405-408, ISSN 0925-4005, https://doi.org/10.1016/j.snb.2012.05.001.	9.221	32
2011	B. Dong, J. Hao, C. -Y. Liaw and Z. Xu, "Cladding-Mode Resonance in Polarization-Maintaining Photonic-Crystal-Fiber-Based Sagnac Interferometer and Its Application for Fiber Sensor," in Journal of Lightwave Technology, vol. 29, no. 12, pp. 1759-1763, June15, 2011, doi: 10.1109/JLT.2011.2140313.	4.439	33
2010	Bo Dong, Jianzhong Hao, Chin-yi Liaw, Bo Lin, and Swee Chuan Tjin, "Simultaneous strain and temperature measurement using a compact photonic crystal fiber inter-modal interferometer and a fiber Bragg grating," Appl. Opt. 49, 6232-6235 (2010), DOI: 10.1364/AO.49.006232	1.961	89
2010	J. Hao, M. Jayachandran, P. L. Kng, S. F. Foo, P. W. Aung Aung, and Z. Cai, "FBG-based smart bed system for healthcare applications," Frontiers of Optoelectronics in China, vol. 3, pp. 78-83, 2010. DOI:10.1007/s12200-009-0066-0	1.871	45

Total number of Publications: Journal: 49, Conference: 52

Selected Invention Disclosures

(Descending Chronological Order, with most recent on top)

Date Accepted	Invention Title - Software/ Prototype Developed or Inventions	Impact E.g.Commercialisation (Yes/ No)
29 Oct 2018	TD2018113 - Method/System for monitoring the thinning of the tube walls in harsh environments	Patent filed in US, Europe, Singapore, China
21 May 2014	TD2013096 - A multi-channel ballistocardiography analysis method using smoothed cepstrum and quality-based dynamic channel selection (TD)	Patent filed US, Singapore, China and Commercialized
13 Jun 2012	TD2012024 - An FBG-based Perimeter Wall Intrusion Detection Sensor (TD)	Commercialized

16 Mar 2011	TD2010200 - A method of packaging an FBG sensor into an armoured optical fibre cable for perimeter fence intrusion detection (TD)	Patent Granted and Commercialized
16 Mar 2011	TD2010199 - Armoured cable based FBG sensor array for perimeter fence intrusion detection	Patent Granted and Commercialized
20 May 2009	TD2008115 - Methods and System for Non-intrusive Monitoring of Patient on a Bed	Patent filed and Commercialized

Total number of Inventions Approved: 25

Selected Patents

(Descending Chronological Order, with most recent on top)

Date Filed	Date Granted/ Licensed	Title of Patents	Impact E.g. Commercialisation
31-12-2019	-	Method and System for Real-Time Monitoring of Wall Thinning and Ascertaining of Wall Attributes using Fiber Bragg Grating (FBG) Sensors	Patent filed in US, Europe, Singapore, China
11-04-2016	29-01-2019/ 01-04-2015	FIBER BRAGG GRATING （FBG） SENSOR (US Patent No. US10190926 B2)	Patent granted in USA and Commercialized
05-11-2015	09-07-2019/ 02-09-2020	A Multi-Channel Ballistocardiography Analysis Method Using Smoothed Cepstrum And Quality-Based Dynamic Channel Selection (US 10,463,311 B2)	Patent granted in USA and Commercialized
04-05-2012	17-05-2016/ 15-10-2012	Fiber Bragg Grating (FBG) Sensor (Singapore patent No. 194782)	Patent granted in Singapore and Commercialized
04-05-2012	10-05-2016/ 01-04-2015	Fiber Bragg Grating (FBG) Sensor (US 9,335,482 B2)	Patent granted in USA and Commercialized
05-04-2006	20-04-2010	Fiber Bragg Grating Sensor (US 7,702,190 B2)	Patent granted in USA

Total number of Patents Filed: 22

Selected Funding (Grant/Industry)

(Role in project, Funding source, Project title, Funding Amount, Project duration: Start date - end date(MM/YY))

1. Lead Co-Principal Investigator, IAF-PP, “Enhancing Offshore System Productivity, Integrity and Survivability in Extreme Environments”, SGD18,971,868.00, 03/2020 to 08/2023.
2. Principal Investigator (PI), IAF-PP, PHARMA INNOVATION PROGRAMME SINGAPORE (PIPS), "FBG Sensors for Condition Monitoring of Glass-Lined Equipment used in Pharmaceutical Manufacturing Integrity Monitoring", SGD 433,995.00, 08/2020 to 06/2022.
3. Principal Investigator, NRF EIRP – Sembcorp-EMA Energy Technology Partnership (SEETP), "An on-line process monitoring scheme to improve accuracy of the tube boiler inspection process", SGD 1,939,858.00, 09/2016 to 08/2018.
4. Principal Investigator, SINGAPORE AEROSPACE PROGRAMME, A*STAR, "Optical Connection Methodologies for Embedding Optical Fiber Sensors in Composite Materials", SGD 195,500.00, 02/2016 to 07/2017.
5. Principal Investigator, ST Electronics (Satcom & Sensor Systems) Pte Ltd, “Development of a PS-OTDR Interrogator and Software for Detecting Excavation”, SGD100,000.00, 02/2016 to 02/2017.
6. Principal Investigator, ST Electronics (Satcom & Sensor Systems) Pte Ltd, “Optical fiber sensors for gas pipeline protection”, SGD150,000.00, 06/2014 to 05/2015.
7. Principal Investigator, ST Electronics (Satcom & Sensor Systems) Pte Ltd, “FBG (armoured) optical fibre cable for perimeter fence intrusion detection and the Research and development of FBG sensor technology for water/oil pipe protection”, SGD368,500.00, 09/2011 to 12/2012.
8. Principal Investigator, Airbus UK, “Use of FBG to monitor bonded repairs”, SGD1,117,000.00, 03/2009 to 09/2012.

Membership on Institutional, National, International, Scientific Advisory Boards or Prestigious Editorial Board

(Descending Chronological Order, with most recent on top)

Period of Appointment	Appointment/Membership Name and brief details	Organisation
2022-present	EXCO member for IEEE Singapore Section	IEEE
2021-present	IEEE Senior Member	IEEE

2020-present	Member of Singapore Battery Consortium, A*STAR	Singapore Battery Consortium
2019-present	Member of new Working Group (WG) on Primary Batteries under the Singapore Standardisation Programme	Enterprise Singapore
2021-2022	Guest editor for MDPI special issue on Fiber Optic Sensors and Application	MDPI
2015-2016	Lead Guest Editor of the Special Issue on “Optical Fibre Sensing” in the Journal of Sensors	Hindawi
2008	Judge for Singapore International Mathematics Challenge	NUS High School
2006-2007	Member and judge of NSC2006 and NSC 2007 Science Contest Committee	Singapore Science Centre
2004-present	Serve as Conference Chairs, Symposium Chairs, TPC in TENCON 2024, ICICN 2021, ICCI 2020, ICAIT 2019, PGC 2017, ICOST2013, PGC2012, OIT 2011, PGC2010, APOS2010, ICCS 2010, ICAIT2009, HealthCom 2008, ICCS 2006, ICCS 2004.	IEEE, NTU, NUS, I^2R etc.
2004-present	Member of SPIE (The International Society for Optical Engineering)	SPIE

Invited Technical Talks

(Descending Chronological Order, with most recent on top)

Date of Event/Talk	Name of Events/Talks	Organisation
18th May 2019	Invited talk: Fiber Optic Sensors for Smart Cities, at “International Day of Light Workshop”	IEEE Photonics Society Singapore Chapter and OSA Singapore Section
Sep 2013	Invited Talk: Fiber Bragg Grating Sensors and Their Applications: From Security to Heath-care	International Optoelectronic Conference (CIOEC) 2013
13-16 Dec 2012	Invited Talk: An Armored-cable-based Fiber Bragg Grating Sensor Array for Perimeter Fence Intrusion Detection	IEEE Photonics Global Conference 2012
28-30 June 2010	Invited Talk: A review of recent developments in FBG interrogation techniques	Asia Pacific Optical Sensors Conference
18-20 Nov 2009	Invited Talk: Applications of Fiber-based Sensors for Healthcare Monitoring	Intelligent Buildings and Smart Homes Conference
2-6 Nov 2003	Invited Talk: Realization of an Embedded Fiber Bragg Grating-Based Pressure Sensor in Fiber-Reinforced Composites	SPIE APOC’2003