Curriculum Vitae

Dr. Hung Lung Allen Huang
Distinguished Scientist Emeritus
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Professional Experience

- **Distinguished Scientist**, University of Wisconsin–Madison (2006-2023)
- **Permanent Principal Investigator**, UW–Madison (2007-2023)
- **Fellow**, International Society for Optical Engineering (SPIE) (since 2007)
- **Adjunct Professor**, Lanzhou University, China & Graduate Faculty, Texas A&M University (2007-2012)
- **Senior Regional Editor**, *SPIE Journal of Applied Remote Sensing* (2007-2023)

Research Expertise

- Hyperspectral infrared atmospheric sounding
- Remote sensing algorithm development (cloud-clearing, radiative transfer, retrieval)
- Data compression and information content analysis
- Satellite instrument design and performance evaluation
- Community satellite processing packages (IMAPP, CSPP)
- Satellite data assimilation and impact study
- Ensemble AI/ML weather forecasting
- Direct broadcast low latency satellite data processing
- GPU acceleration of NWP model
- Meteorological satellite data end-to-end system design and implementation

Major Projects & Programs

- Principal Investigator, NASA IMAPP (since 1999-2021)
- Principal Investigator, NOAA CSPP (2011-2023)
- Principal Investigator, NOAA CIMSS GOES-R Risk Reduction (2003–2008)
- Principal Investigator, ONR MURI (2004)
- Science Team Member: AIRS and MODIS

Leadership & Service Roles

- Co-Chair, International TOVS Working Group (ITWG) (2006–2013), Treasurer (2013–2018)
- Member, National Academies Space Studies Board (2008–2011)
- Member, International Radiation Commission (2005–2008)
- Chair/General Chair, SPIE and OSA conference series (2003–2010)
- Executive Committee, SPIE Optical Engineering + Applications (2008)

- Science Council, CIMSS (2002-2020)
- Distinguished Prefix Review Committee, UW–Madison (2010-2023)
- Chair, International Conference Steering Committee (ICSC), Asia Oceanic Meteorological Satellite Users' Conference (AOMSUC)

Entrepreneurial Activities

- **President and Principal Scientist**, Hyper Sensing LLC (since 2002)
- **President**, Weather Or Knot, LLC (since 1997)
- **CIO and Board Member**, GeoMetWatch, USA (2012–2014)
- **Technical Advisor**, Tempo Quest Inc. (2014–2015)
- **Technical Advisor,** Weather Stream (since 2023)
- **Consultant**, TRW, Northrop Grumman (NPOESS project, 2001–2008)

Editorial Boards & Review Committees

- Senior Regional Editor, *Journal of Applied Remote Sensing* (SPIE)
- Member, Distinguished Prefix Review Committee, UW–Madison
- Frequent reviewer for journals including *JGR*, *IEEE TGRS*, *JAMC*, and *Remote Sensing of Environment*

Education

- Ph.D., Meteorology, University of Wisconsin–Madison
- M.S., Meteorology, University of Wisconsin–Madison
- B.S., Atmospheric Science, National Taiwan University

Honors & Recognition

- SPIE Fellow (2007)
- Distinguished Scientist Award, University of Wisconsin–Madison
- Multiple NASA Group Achievement and Team Awards

Professional Memberships

- SPIE (Fellow)
- American Meteorological Society (AMS)
- IEEE Geoscience and Remote Sensing Society (GRSS)

Key publications:

- 95 Journal Articles: https://pubs.ssec.wisc.edu/research_Resources/publications/affiliation/author?authorText=Huang,%20Hung-Lung%20Allen&numOfRecs=25

- 317 Gray Literature (Reports, Algorithm Documents, Conference Proceedings): https://pubs.ssec.wisc.edu/research_Resources/publications/affiliation/author?authorText=Huang,%20Hung-Lung%20Allen&numOfRecs=25&tab=gray

Summary of Dr. Hung-Lung "Allen" Huang's Distinguished Career

Dr. Hung-Lung Allen Huang is a globally recognized pioneer and thought leader in satellite meteorology, atmospheric remote sensing, and advanced environmental data systems. As a Distinguished Scientist Emeritus at the University of Wisconsin–Madison's Space Science and Engineering Center (SSEC), his career spans over four decades of transformative contributions that have profoundly shaped how Earth observation satellite data is processed, disseminated, and applied for weather, climate, and disaster resilience.

1. Pioneer in Satellite Meteorology and Hyperspectral Remote Sensing

Dr. Huang played a foundational role in the design, development and operational use of hyperspectral infrared sounders—such as AIRS, IASI, CrIS, and GIIRS. He led scientific and algorithmic advancements that enabled the extraction of high-accuracy atmospheric temperature, moisture, and wind profiles from these instruments. His work significantly improved the assimilation of satellite data into Numerical Weather Prediction (NWP) models, enhancing global forecasting accuracy.

He introduced and championed:

- Advanced cloud-clearing and radiative transfer techniques.
- Adaptive bias correction algorithms for satellite radiances.
- Multi-sensor synergy for soundings, principal component analysis (PCA), principal component compression (PCC), principal component regression (PCR).

2. Innovator in Satellite Data Processing and High-Performance Computing

A strong proponent of scalable, real-time satellite data processing, Dr. Huang spearheaded the creation of:

- **IMAPP** (International MODIS/AIRS Processing Package), funded by NASA.
- **CSPP** (Community Satellite Processing Package), funded by NOAA.

These software frameworks have become essential global tools for environmental satellite data users, enabling real-time generation of Level 1 and Level 2 products from polar and geostationary weather satellites. His efforts made operational processing accessible to researchers and institutions worldwide.

He also led efforts in:

- GPU acceleration of Weather Research Forecast (WRF) model.
- Parallelized big data pipelines for environmental applications.

- AI/ML Augmented Hyper Local weather forecast.

3. Champion of International Collaboration and Capacity Building

As Chair of the International Coordination Steering Committee (ICSC) of the Asia-Oceania Meteorological Satellite Users' Conference (AOMSUC), Dr. Huang has been a strategic force in fostering international partnerships between national meteorological services, space agencies, and the World Meteorological Organization (WMO).

Under his leadership, AOMSUC has:

- Grown into a premier regional forum for satellite data users.
- Facilitated training and knowledge transfer across more than 30 countries.
- Promoted regional data exchange, especially through CMA, JMA, KMA, NOAA, and EUMETSAT.

He has also led regional and global workshops, mentoring early-career scientists and promoting the use of satellite data in climate adaptation, disaster warning, and resilience.

4. Prolific Author and Editorial Leader

Dr. Huang has authored or co-authored over **100 scientific publications**, including:

- Peer-reviewed journal articles (e.g., JGR, GRL, IEEE TGRS, JARS).
- SPIE conference proceedings and special issues (as volume editor and contributor).
- Algorithm theoretical basis documents (ATBDs) for NOAA/NASA missions.

His editorial work has shaped discourse on topics such as satellite big data for AI, calibration/validation strategy, and hyperspectral sounding.

5. **Recognition and Legacy**
   Dr. Huang's achievements are widely acknowledged in the atmospheric and space science communities. His legacy includes:

   - Influencing the design and operation of major satellite missions (MODIS, AIRS, IASI, CrIS, Himawari-8/9, FY-4A/B, MTG).
   - Institutionalizing regional satellite processing capacity through software tools used globally.
   - Strengthening international cooperation in Earth observations, especially in the Asia-Oceania region.
   - As a scientist, mentor, technologist, and global connector, **Dr. Allen Huang's contributions have advanced both the science and societal value of satellite meteorology.**