Artificial Intelligence Center (AIC)

Mubarak Shah

Center for Research in Computer Vision (CRCV)

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Artificial Intelligence Initiative(AIA)

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AI Initiative

- The aim of the AI Initiative is to leverage success in one core area of AI, Computer Vision, to expand to other core areas of AI:
  - Robotics
  - Natural Language Processing (NLP)
  - Speech Recognition (SRI, Alexa)
  - Machine Learning
- Foundational and supporting areas of AI like
  - Mathematics
  - Statistics
  - Efficient and Innovative AI computing
  - Cyber Security
- Applications
  - Optical Computing
  - Medicine
  - Fintech
  - Others

Center for Research in Computer Vision (CRCV)

- Computer Vision at UCF has been **ranked No. 10 nationally** by CSRankings.org
  - while UF is ranked 48; FIU is ranked 82; USF is ranked 89; FSU is ranked 99.
- CRCV received $5.9M in research funding by 4 CRCV faculty and 42 Ph.D. students; +11 New Ph.D. students in Fall 2022!
- New Funding:
  - $475K from Accenture Federal Systems (AFS)
  - $2.8 million from IARPA for **BRIAR** program FAS
  - $1.4 Million from ARL
  - $118K from NSF as sub to NJIT (Chen)
  - $95K from Lockheed for ATR (Mahalanobis)
  - $102K from Lynntech for ATR (Mahalanobis)
  - $56K from Invariant form IMPACT (Mahalanobis)
  - $90K from Mayachitra for Cross Platform Reinforcement and Transfer (Mahalanobis)
- **MS in Computer Vision** (UCF is first public University to offer)
- Enrollment in CAP5415 Computer Vision has doubled: 2019: 62; 2020:55; **2021:97**
- Enrollment in CAP6412 Advanced Computer Vision: 2019: 18; 2021: 30; **2022**: **53/38**
- Six papers in **International Conference on Computer Vision** (ICCV) 2021
- Six papers accepted to **Computer Vision and Pattern Recognition 2021** **CVPR**
- Nine papers accepted in CVPR-2022!

Supported by Six Colleges

CECS

COS

COB

COM

CREOL

CGS

Original Budget

Request From SIP:

- Recurring**($2,840,400**): 15 Faculty and two Staff;
- Non-Recurring**($4,750,000**):
  - Startups, 10 Post Docs,
  - 20 GRAs,
  - Undergraduate, High School Students and Teacher Research Experience, and
  - Faculty, GRA and Postdoc recruiting

Matching Commitment:

- Recuring (**$2,084,230**) + Startup (**$1,555,500**)
  - CECS: 5 faculty lines at $568K;
  - COS 2.25 faculty lines at $218K and $140K startup;
  - COM: 1 faculty line at $200K;
  - CREOL: 1 faculty line at $150K and $500K startup;
  - COB: 1 faculty lines at $200K and $50K startup;
  - FCI: 2 faculty lines at $175K and $615.5K startup;
  - Rosen: 1 faculty line at $80K;
- Non-Recuring (**$1,815,000**)
  - CGS 10 post docs for two years at $550K;
  - CRCV: $300K;
  - CECS: $500K for Equipment;
  - FCI: $100K;
  - COS: $100K;
  - CEE: $150K.

This is BIG!

- 30 faculty lines and over $4 million in non-recurring funds.
- Aim is to **scale** up the current **excellence** in Computer Vision and to other areas of AI:
  - Robotics
  - Natural Language Processing
  - Machine Learning
  - Speech Recognition
  - Foundational areas of AI
  - Application areas
- **Impact = Excellence x Scale**

- To have the highest possible **impact** on students, community, and Science.

Updated Budget

Academic Excellence Fund

- Recurring**($1,000,000**): Faculty salary
- Non-Recurring**($3,000,000**):
  - Startups, 4 Post Docs,
  - 8 GRAs,
  - Undergraduate, High School Students and Teacher Research Experience, and
  - Faculty, GRA and Postdoc recruiting

Matching Commitment:

- Recuring (**$1,979,430**) + Startup (**$1,357,000**)
  - CECS: Faculty lines at $568K and $500K startup;
  - COS 2.25 faculty lines at $218K and $140K startup;
  - COM: 1 faculty line at $200K;
  - CREOL: 1 faculty line at $150K and $500K startup;
  - COB: 1 faculty lines at $200K and $50K startup;
  - FCI: 2 faculty lines at $175K and $417K startup;
- Non-Recuring (**$865,000**)
  - CGS 10 post docs for two years at $550K;
  - FCI: $100K;
  - COS: $100K;

This is BIG!

- Approximately 20 faculty lines and $3 million in non-recurring funds.
- Aim is to **scale** up the current **excellence** in Computer Vision and to other areas of AI:
  - Robotics
  - Natural Language Processing
  - Machine Learning
  - Speech Recognition
  - Foundational areas of AI
  - Application areas

- **Impact = Excellence x Scale**

- To have the highest possible **impact** on students, community, and Science.

Structure

- PI will lead the Initiative
- This Initiative will be overseen by
  - Executive Committee and
  - Council of Deans and VPs

Oversight/Executive Committee

- Mubarak Shah, Chair;
- Members:
  - Yan Solihin, Interim Dept Chair CS, Director of Cyber Cluster;
  - Nazanin Rahnavard, Professor ECE; (AI)
  - Gita Sukthankar, Professor CS; (Robotics)
  - Fei Liu, Associate Professor CS; (NLP)
  - Mohamed Abdel-Aty, Dept Chair CEEE; (Smart Cities)
  - Xin Li , Dept Chair Mathematics; (Theory of Deep Learning)
  - Mitchell Hill, Assistant Professor, Statistics; (Data Analytics)
  - Dexter Hadley, AI Chief COM; (Fairness, NLP)
  - CREOL
  - COB

Council of Deans/VPs

- Michael Georgiopoulos, Dean CECS;
- Deborah German, Dean COM;
- David Hagan, Dean COP;
- Maggy Haslett-Tomova, Dean COS;
- Paul Jarley, Dean COB;
- John Weishampel, Associate Dean CGS;
- Winston Schoenfeld, FCI and Assistant VPR;
- Elizabeth Klonoff, VPR

Faculty Hiring

- One general ad will be placed at appropriate venues
- Search committee will consist of representatives from all units
- The executive committee will make the decision to hire or not based on Search Committee recommendation
- The PI will make an offer after the approval of the corresponding Dean
- If the Initiative faculty leaves UCF, the line will go back to the corresponding College.

Faculty Expectations

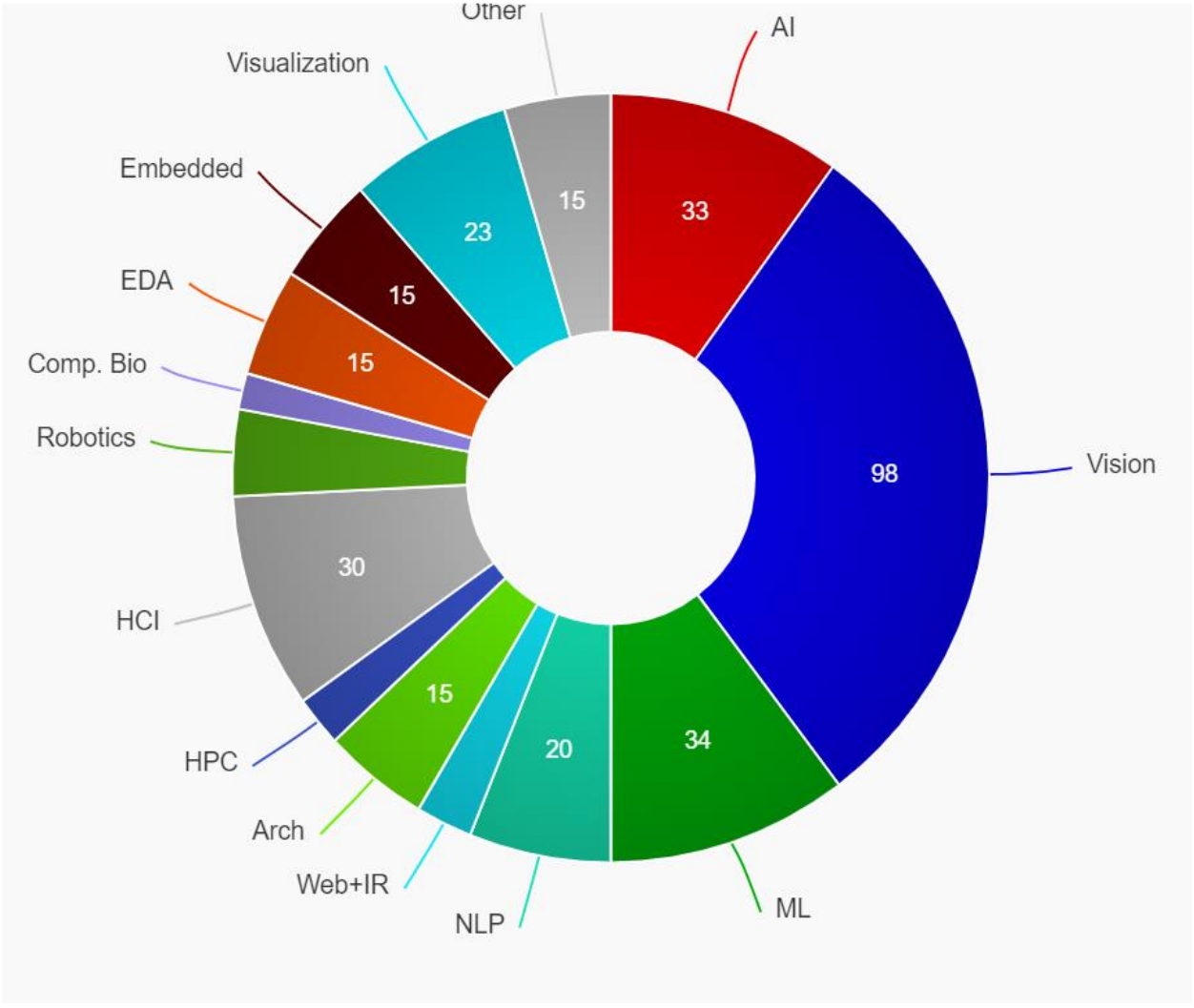
- Faculty hired under this initiative will be tenured in corresponding departments.
- Faculty will teach one course per semester, engage in active research and bring in significant amount of external research funding.
- The goal is that each faculty on average, will bring $1 million per year.
  - However, The funding level will vary from college to college
- Annual evaluations of the faculty will be jointly done by the department chair and the Initiative Lead, with input from the executive committee.
- Faculty not performing at the expected level will be assigned regular department teaching load.

Benefit for UCF's research and educational missions

- If CRCV operation model is followed and all ~20 faculty are hired
  - Research funding could reach $20 million per year
  - The number of Ph.D. students will increase by 200
  - Ranking of Core areas of AI will improve resulting in boost in CS ranking
    - Due to just one junior Associate Professor in NLP, UCF's NLP ranking is 57!
    - One un-tenured CRCV Assistant Professor has h-index of 48!
  - Ranking of other disciplines e.g. Statistics, Math, ECE should also improve
  - New MS Degrees in Robotics, NLP, ML will be introduced
  - New Ph.D. Degrees in CV, NLP, Robotics, ML
  - Critical mass of AI faculty will facilitate large proposal efforts, such as NSF ERC, NSF AI Institutes, NSF STC

Thank You

UCF CS Ranking csrankings.org



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Google Scholar

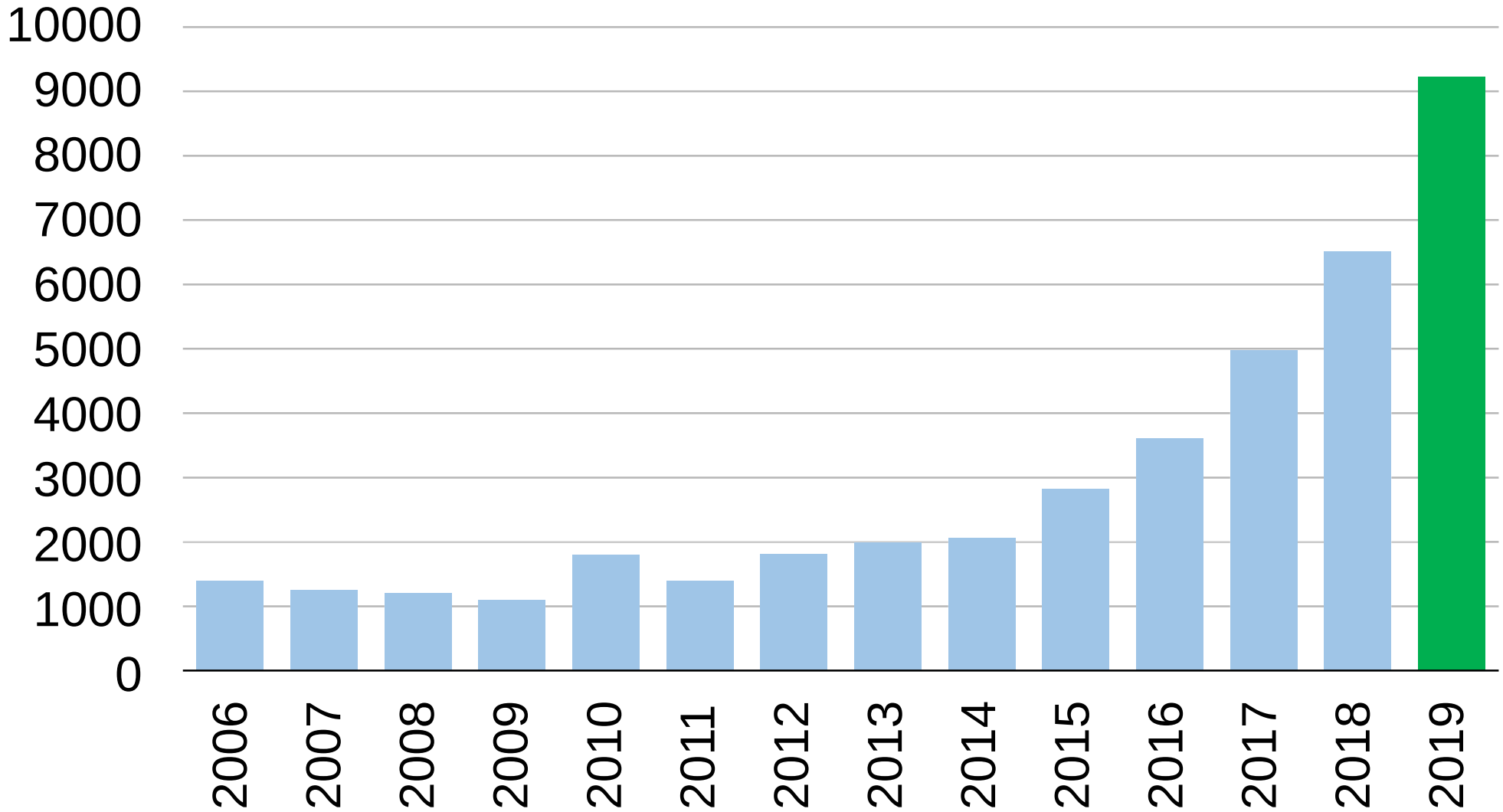
Top publications

Categories

English

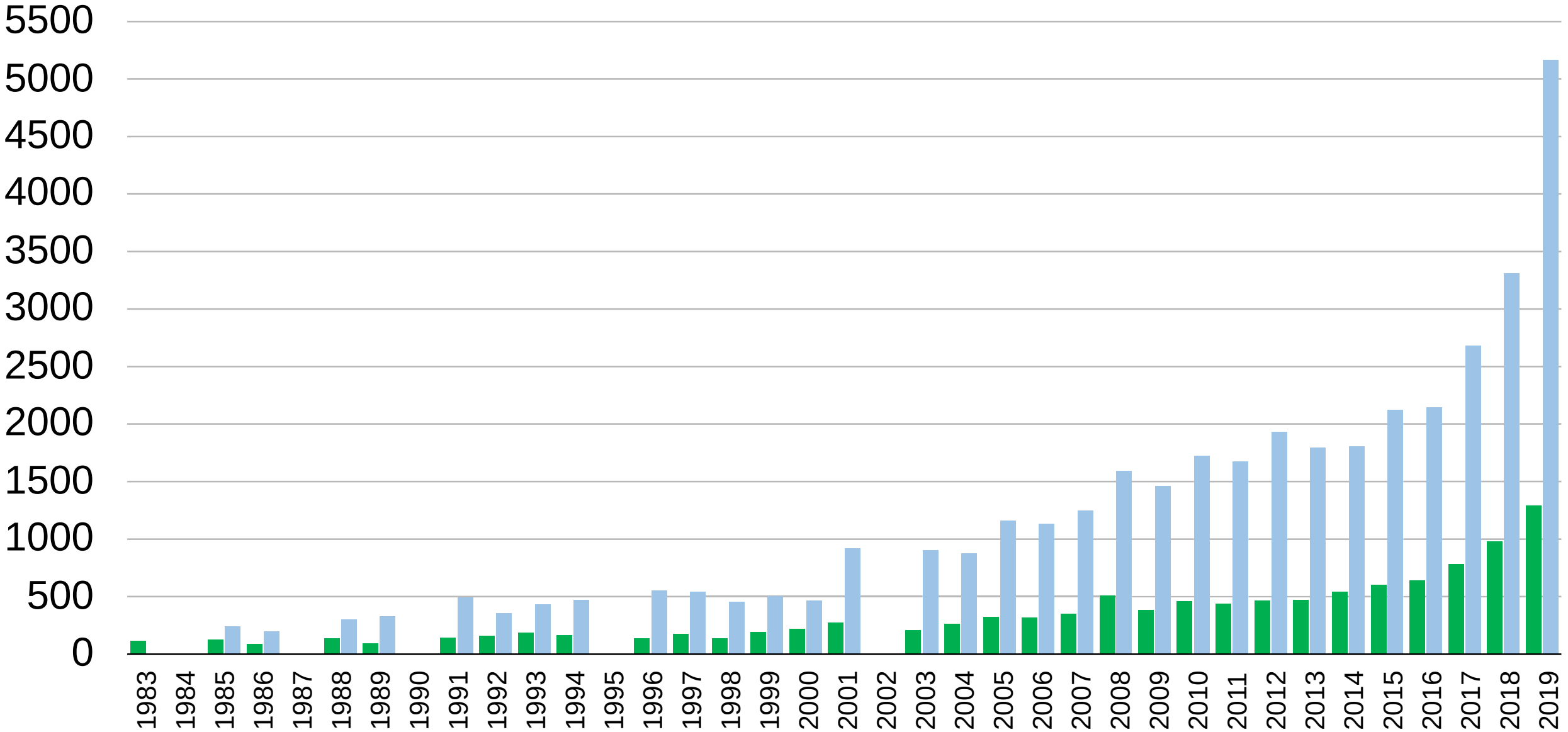
	Publication	h5-index	h5-median
1.	Nature	414	607
2.	The New England Journal of Medicine	410	704
3.	Science	391	564
4.	IEEE/CVF Conference on Computer Vision and Pattern Recognition	356	583
5.	The Lancet	345	600
6.	Advanced Materials	294	406
7.	Cell	288	459
8.	Nature Communications	287	389
9.	Chemical Reviews	270	434
10.	International Conference on Learning Representations	253	470

CVPR Attendance Trend



CVPR Submitted and Accepted Papers

56% yearly growth with 26% acceleration → 10.8B submitted papers in 2028



CRCV has Nine papers at CVPR-2022!

1. Ristea, Nicolae-Catalin; Madan, Neelu; Ionescu, Radu Tudor; Nasrollahi, Kamal; Khan, Fahad Shahbaz; Moeslund, Thomas B.; Shah, Mubarak, *Self-Supervised Predictive Convolutional Attentive Block for Anomaly Detection*
2. Karim, Nazmul; Rizve, Mamshad Nayeem; Rahnavard, Nazanin; Mian, Ajmal; Shah, Mubarak *UNICON: Combating Label Noise Through Uniform Selection and Contrastive Learning*
3. Acsintoae, Andra; Florescu, Andrei; Georgescu, Mariana-Iuliana; Mare, Tudor; Sumedrea, Paul; Ionescu, Radu Tudor; Khan, Fahad Shahbaz; Shah, Mubarak, *UBnormal: New Benchmark for Supervised Open-Set Video Anomaly Detection*
4. Dave, Ishan Rajendrakumar; Chen, Chen; Shah, Mubarak, *SPAct: Self-supervised Privacy Preservation for Action Recognition*
5. Kumar, Akash; Rawat, Yogesh Singh End-to-End Semi-Supervised Learning for Video Action Detection
6. Mendieta, Matias; Yang, Taojiannan; Wang, Pu; Lee, Minwoo; Ding, Zhengming; Chen, Chen, *Local Learning Matters: Rethinking Data Heterogeneity in Federated Learning*
7. Zhu, Sijie; Shah, Mubarak; Chen, Chen, *TransGeo: Transformer Is All You Need for Cross-view Image Geo-localization*
8. Cao, Jiale; Pang, Yenwai; Anwer, Rao Muhammad; Cholakkal, Hisham; Xie, Jin; Shah, Mubarak; Khan, Fahad Shahbaz, *PSTR: End-to-End One-Step Person Search With Transformers*
9. Gupta, Akshita; Narayan, Sanath; Joseph, K J; Khan, Salman; Khan, Fahad Shahbaz; Shah, Mubarak, *OW-DETR: Open-world Detection Transformer*

Robustness in Sequential Data

CVPR 2022 workshop
June 20, 2022
New Orleans, Louisiana

Updates

- **Mar 10, 2022:** Challenge leaderboard now live HERE.
- **Mar 08, 2022:** Evaluation dataset released (check **challenge page** for more details).
- **Mar 08, 2022:** Dates updated for workshop and challenge.

Overview

Most of the real-world data is sequential and there is always a distribution shift when we move from training set to real-world testing scenario. This workshop invites researchers from both academia and industry to advance the research in robust learning for real-world applications. The goal of this workshop is to explore the fundamental problems in the characterization of distribution shifts in sequential data and to develop robust models for sequential data for real-world applications.

First International Workshop on Federated Learning for Computer Vision (FedVision)

Federated Learning (FL) has become an important privacy-preserving paradigm in various machine learning tasks. However, the potential of FL in computer vision applications, such as face recognition, person re-identification, and action recognition, is far from being fully exploited. Moreover, FL has rarely been demonstrated effectively in advanced computer vision tasks such as object detection and image segmentation, compared to the traditional centralized training paradigm.

This workshop aims at bringing together researchers and practitioners with common interests in FL for computer vision and studying the different synergistic relations in this interdisciplinary area. The day-long event will facilitate interaction among students, scholars, and industry professionals from around the world to discuss future research challenges and opportunities.

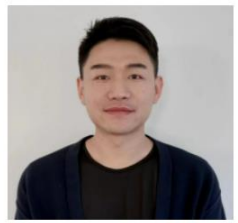
Keynote Speakers

Yiran Chen
Duke University

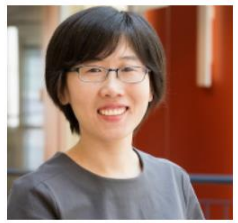
Salman Avestimehr
University of Southern California, Amazon

Zheng Xu
Google

Jeffrey Byrne
Visym Labs



Handong Zhao
Adobe



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