



جامعة الملك عبد الله
للعلوم والتقنية
King Abdullah University of
Science and Technology

ePosters Replace Print Posters: KAUST Library Initiative to Better Prepare Students and Preserve Scholarly Resources

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Garry Hall

Eman Afandi



University
Library

Academic Divisions



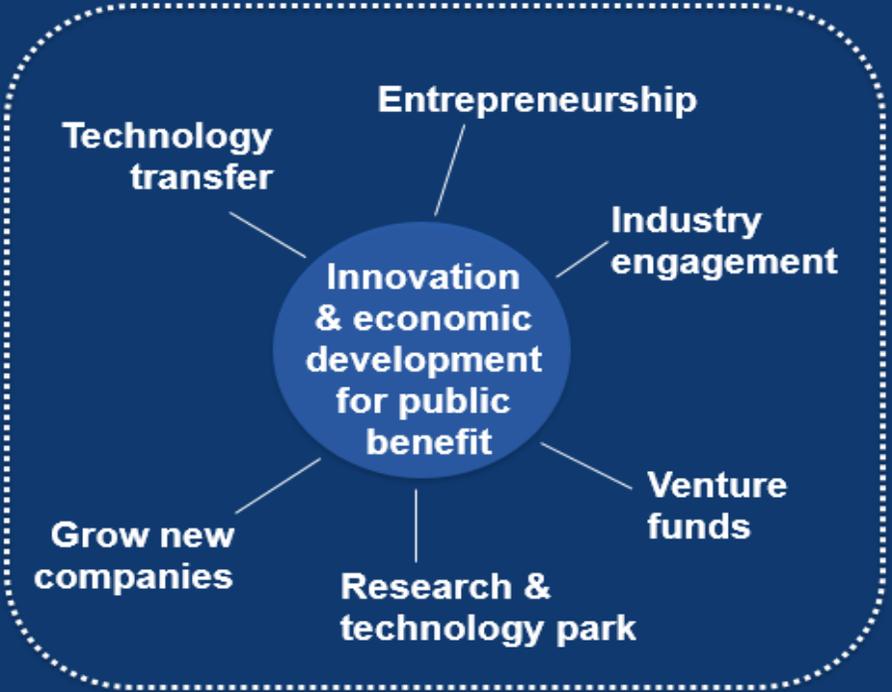
Biological and Environmental Science and Engineering (BESE)



Computer, Electrical and Mathematical Science and Engineering (CEMSE)



Physical Science and Engineering (PSE)



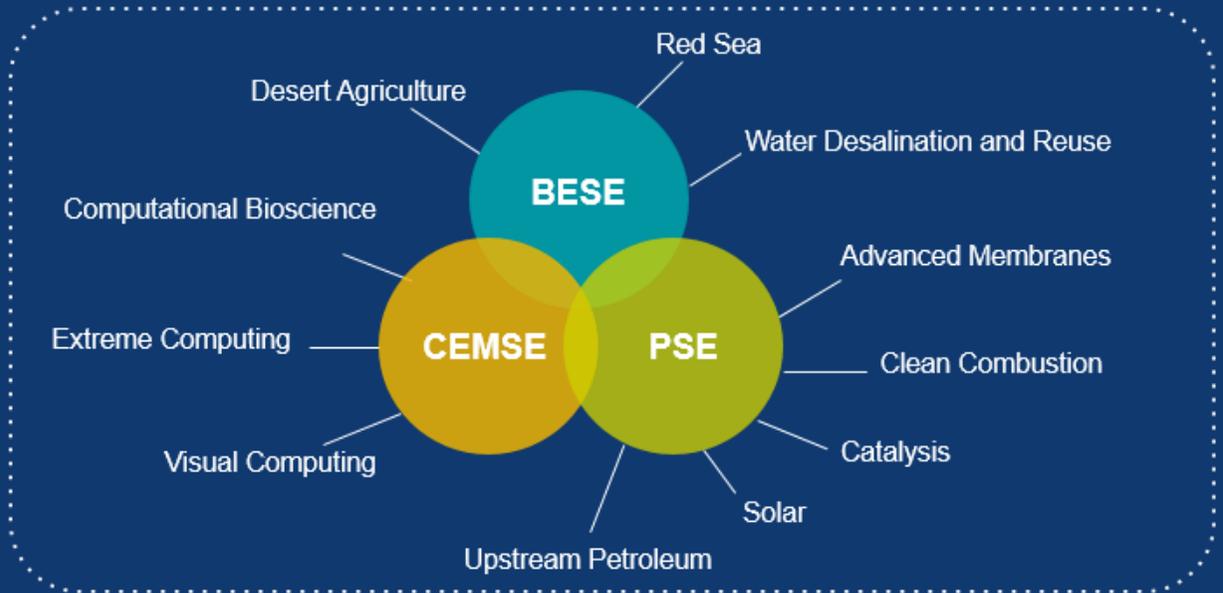
Sustained Resources

CORE LABS

- Analytical Chemistry
- Biosciences
- Coastal & Marine Resources
- Greenhouse
- Imaging & Characterization
- Nanofabrication
- Supercomputing
- Visualization
- Central Workshops



Research Centers



University Library

- **Born digital (98% of collection is online)**
- **Open 24x7 with inspiring space and highly specialized collection**
- **First Open Access mandate in the Middle East**
- **Best Library Architecture award from AIAA / ALA in 2011**
- **Successful research repository supported by policies and tools**
- **Direct relations and negotiations with publishers and vendors**
- **Great involvement of staff in regional and international professional forums with focus on professional development**
- **Highest level of community satisfaction and engagements**



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Library Service Role @ KAUST

Information Resources

- Focused Collection
- 98% Collection in electronic
- Trainings & Liaison
- Document Delivery

Preservation & Curation

- Research Repository
- Open Access
- Research Data Management
- Records Management & Archives

Collaborative Space

- Learning Space
- Quiet Areas
- Academic & Social Events
- Technology



KAUST Library ePoster service project back ground

WHY

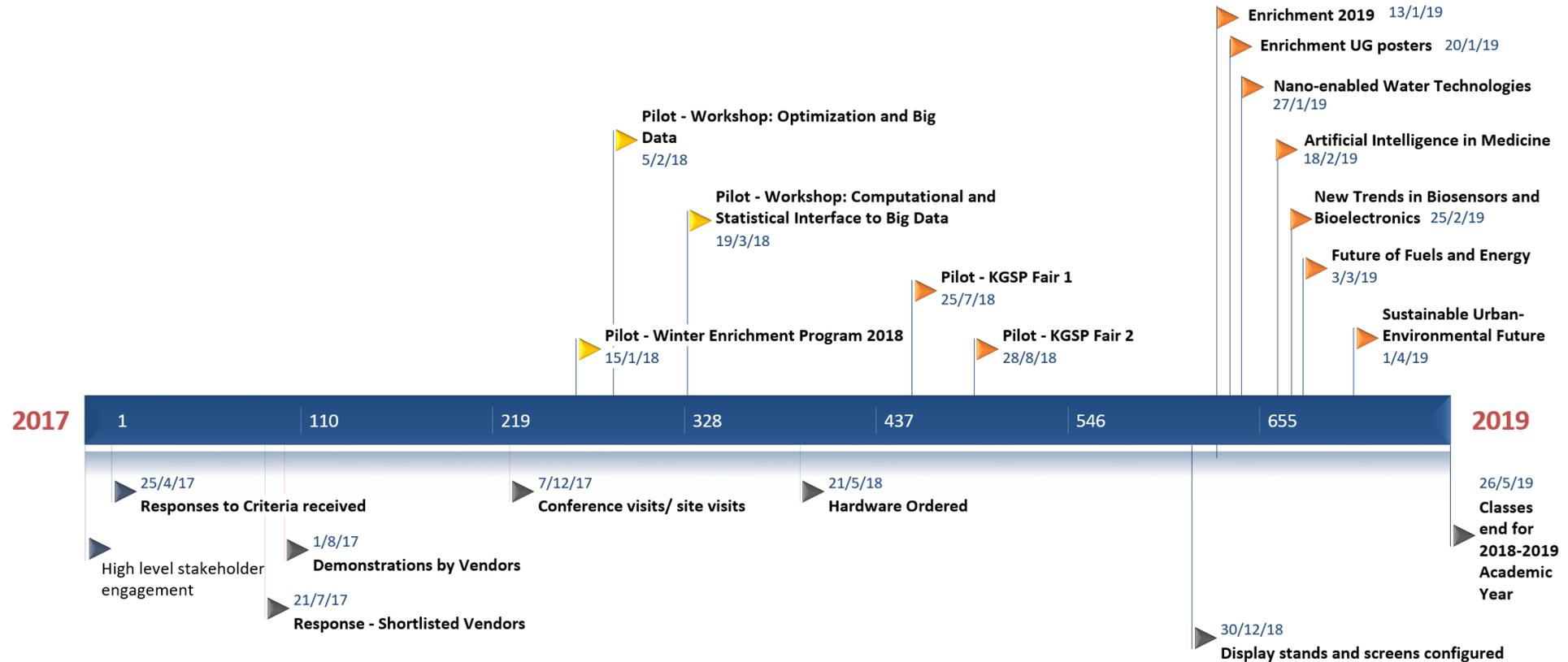
- We offer **Space as a Service** – Apx 12 scientific posters sessions are held in the library annually.
- We provide **Preservation and Curation** – hard to get hold of posters after the sessions.
- Many scientific organizations' were moved to ePosters. There was a need to **upskill our Students and prepare them** for eposter creation and sessions.

HOW

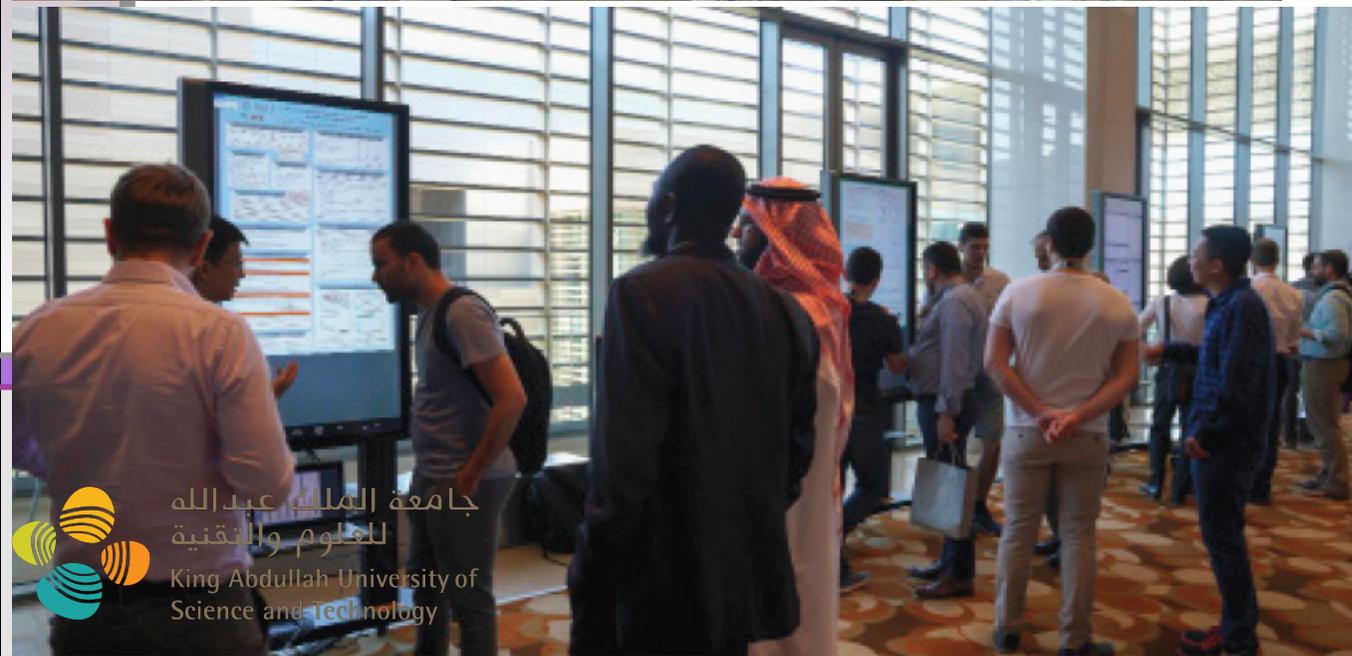
- In 2017 Library initiated discussions with stake holders and proposed ePoster project.
- Trialed commercially available system with graduate students and post docs. A list of criteria was prepared, and asked companies to respond.
- Shortlisted companies provided trials and webinar information. Visits to headquarters/conferences. Suitable system was selected and in parallel, and with KAUST IT support, suitable display touchscreens were sourced, along with display stands for the pilot projects (Jan 2018).
- By mid 2018, after successful many pilots sessions and incorporating feedbacks, final service (**KAUST Library ePoster Service**) is approved.



Timeline – KAUST Library ePoster Service



THE DIGITAL TRANSFORMATION in poster sessions



Deep Learning for High Dynamic Range Imaging

Masheal Alghamdi | Wolfgang Heidrich | KAUST

Background: HDR Photography

The goal of HDR imaging is to have a greater dynamic range between the darkest and lightest areas of an image. HDR images can represent more precisely real scenes' intensity levels.



Mainly, there are three common techniques for HDR photography: (i) sequentially capturing and fusing multiple exposures (e.g. [1], [2]). While this method is easily supported by existing cameras, additional de-noising and motion stabilization techniques are usually needed. (ii) Simultaneously utilizing multiple sensors to capture different exposures (e.g. [3]). This sophisticated approach is more expensive and needs rigorous calibration. (iii) Capturing single coded exposure image, along with a proper algorithm for HDR image reconstruction [4], [5], and [6]).

Contribution

In this project, we propose using deep learning to reconstruct HDR image from single shot coded pixel exposure computational cameras. We used deep networks for coded mask calibration, and HDR image reconstruction. Our method supports joint designing of optical elements and learning algorithms. Once trained, the obtained deep networks weights can be used for quick and simple coded mask calibration and a well HDR reconstruction of images greatly differing from the training set.

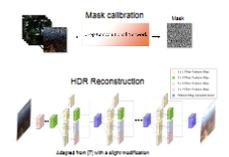
Image Model

$y = f(MPF)$, where:

- y is the coded LDR image
- f is the Camera response function
- M is the coded MASK
- P is the point spread function
- z is the relative radiance

Method

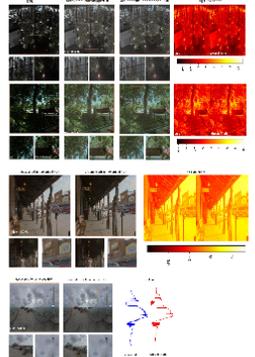
- Given y_1, y_2, \dots, y_n captured with the same camera learn the Mask M via deep convolutional neural network.
- Given the learned mask M and y_n , learn the relative radiance z_n by using convolutional network-in-network structure introduced in [7].



Experiments

- The set of HDR images used for training are gathered from the following online datasets (DML-HDR, Fairchild, Fun-HDR, Stanford, UIUC HDR, Borealis, WDC Archive).
- 900 HDR images used for training and 184 for testing.
- For training we used online augmentation (rotation, flipping, and color augmentation).
- Mask: Random uniform & exposure masks are used, with $\text{Mask} = 64$

Results



References

[1] N. S. James & R. S.zelensky, "Learning to fuse multiple images by learning priors," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2005, pp. 1001-1008.

[2] D. Brown, "A simple algorithm for HDR image fusion," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2005, pp. 1009-1016.

[3] J. Kim, M. Kim, S. Cho, & S. Lee, "A simple HDR image fusion method," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2005, pp. 1017-1024.

[4] S. G. Kang, S. W. Lee, & S. K. Lee, "A simple HDR image fusion method," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2005, pp. 1025-1032.

[5] S. G. Kang, S. W. Lee, & S. K. Lee, "A simple HDR image fusion method," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2005, pp. 1033-1040.

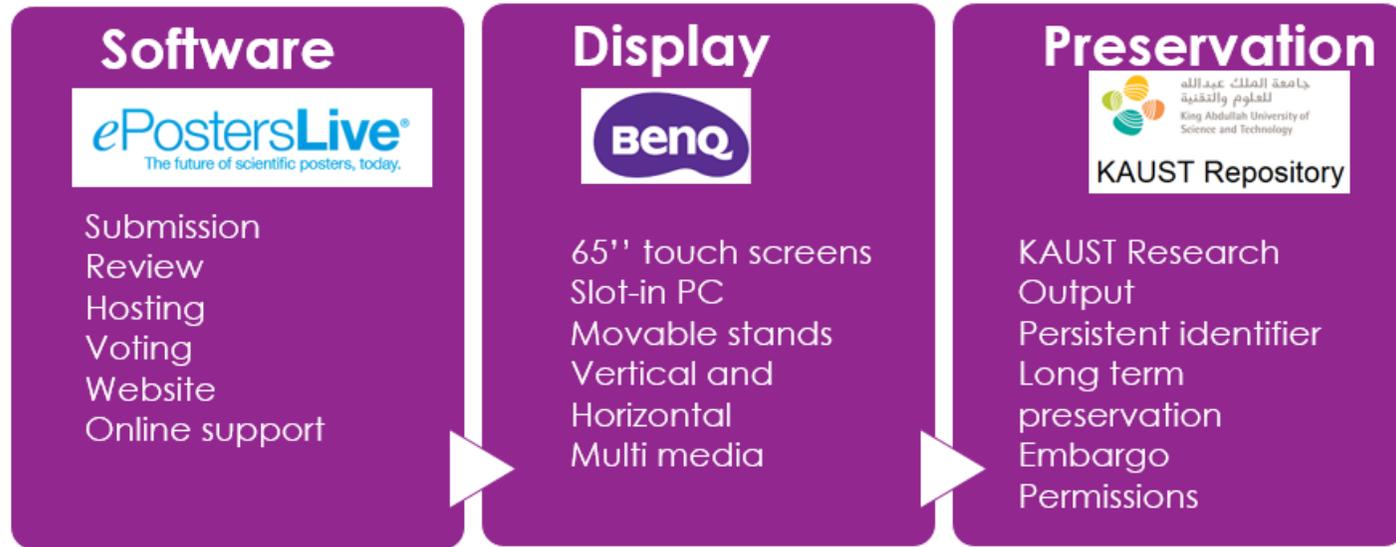
[6] S. G. Kang, S. W. Lee, & S. K. Lee, "A simple HDR image fusion method," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2005, pp. 1041-1048.

[7] S. G. Kang, S. W. Lee, & S. K. Lee, "A simple HDR image fusion method," in *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition*, 2005, pp. 1049-1056.

Search GO PREVIOUS **P02**
Current NEXT



architecture



Library initiative to better prepare students and preserve scholarly resources

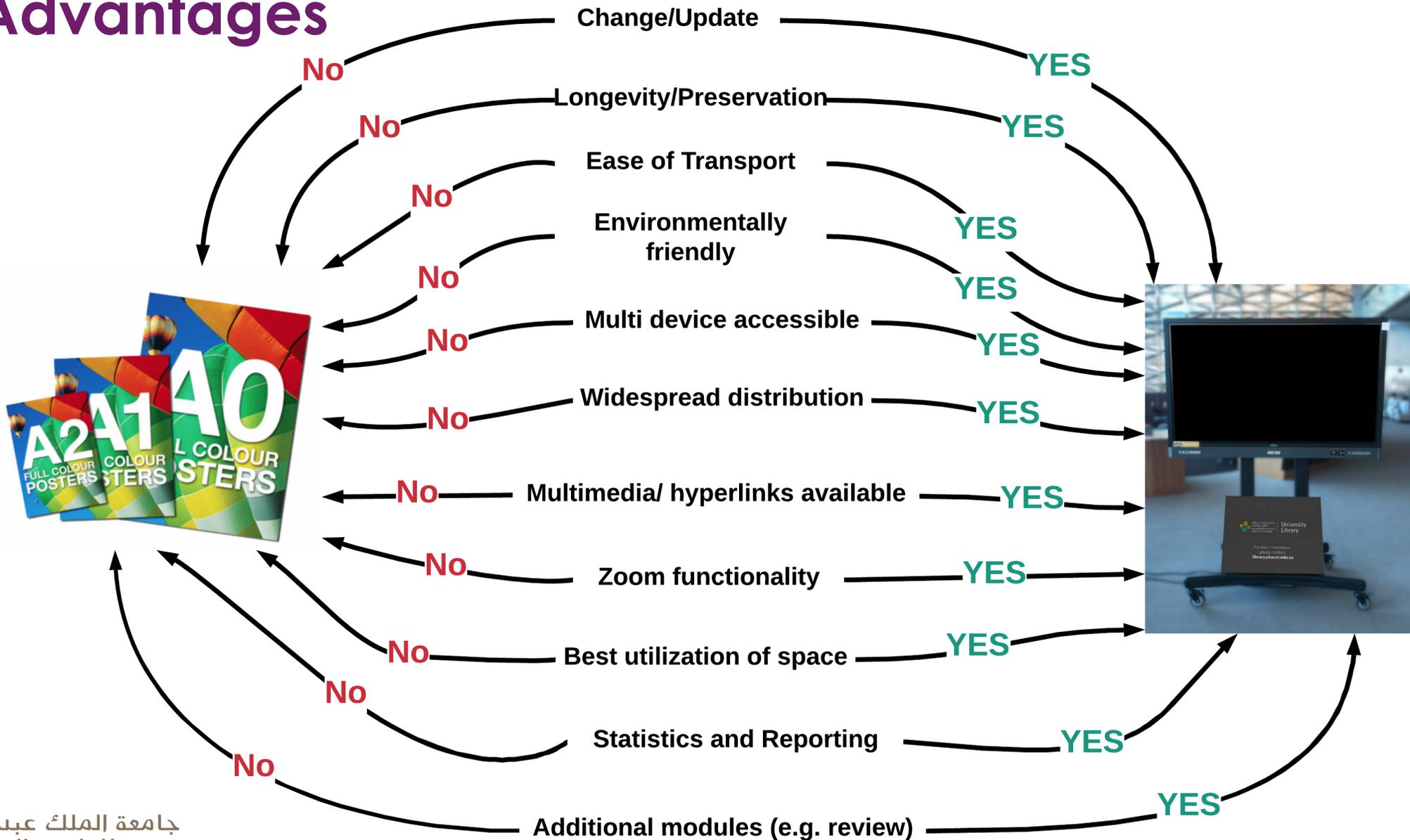
Touch screen 65" Model: RP653K 450nits, 3840x2160 UHD, BenQ unique ID, IR 10 points touch, 20W*2 built-in SPK, EZWrite4.0Ltie APP, Android 5.0 embedded

PC: OPS PC i7, 8GB, 500GB (4K Graphics Card)

Display stand: Custom floor stands with landscape & Portrait orientation

ePosterslive contract charge for 10 events
Enhanced video/audio availability option
Additional equipment (cables, router, backup laptops, spare slot-in PC)
Identified customization (automated repository upload, local KAUST server implementation, synchronization, knowledge transfer and training)

Advantages



Beneficiaries

Feature	Student	Preservation Efforts	Other
Change/Update	X		
Longevity/Preservation	X	X	
Ease of Transport	X		
Environmentally friendly			All
Multi device accessible	X		Participants
Widespread distribution	X	X	
Multimedia/hyperlinks	X		
Zoom functionality	X		
Space Utilization			Organizer
Statistics and Reporting	X		Organizer/Library
Additional Modules			Organizer/Judges



Disadvantages/ Challenges

- **Initial setup is reasonably complex process**, especially if you are in Saudi Arabia. For example, as backup we're currently working on a virtual server to ensure local access if Internet outage occurs.
- **Cost**; we chose touch screens but it is possible to use LED screens. These sacrifice zoom functionality and more closely resembles the situation with print but are much cheaper to implement.
- Dealing with **change management** in academia!!!!



Website built for each event

<https://epostersonline.com/wepug2019/>

34 posters, 84 authors, 8 institutions

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Undergraduate Poster Competition 2019

20 - 24 JANUARY 2019 | THUWAL, SAUDI ARABIA



Home Posters by ID Posters by Title Authors Affiliations Poster Comparison

Enter terms then hit Search...



Posters

P01
Ti₃C₂ MXene Electrodes for Surface Electromyography

Patrick Mulcahey

Poster Presenter: Patrick Mulcahey

★ ★ ★ ★ ★

No votes yet

P02
An In Situ Study of the Fluid Flow in 3D Printing of PLA

Benjamin Weldon

Poster Presenter: Benjamin Weldon

★ ★ ★ ★ ★

No votes yet

P03
Combined effect of temperature and high levels of CO₂ on the physiology of *Ostrea chilensis* (Philippi, 1845) from an estuary in southern Chile

Natalia Rocha Donoso

Poster Presenter: Natalia Rocha Donoso

★ ★ ★ ★ ★

No votes yet

P04

P05

P06

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The Saltwater Greenhouse: A Sustainable Food System to Serve Sustainable Cities of the Future

Authors: Nathaly Rodriguez Ortiz, Ryan Leifer, Gabriele Fiore, Mark Tester



The saltwater greenhouse combines advances in agricultural engineering and plant science to save 75-90% of the total fresh water normally used to grow crops like tomatoes.

Engineering

- Saltwater based evaporative cooling requires the fresh water that would otherwise be used to be evaporated and cool the greenhouse (GH). This alternative cooling method has many benefits when compared to outdoor and standard controlled environmental agriculture.
- Significant savings in water and energy
- Higher yield production of up to 25x annually
- Helps deliver food, water and energy security
- Improved economic viability and societal consistency of products



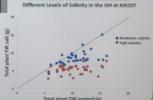
Plant Science



Some wild tomatoes from the Galapagos Islands are capable of growing and bearing fruit even when irrigated with half seawater, but the yield and quality of these wild tomatoes is low.

We are working to develop commercial lines of tomatoes that are salt tolerant through the modern processes of selection, hybridization and grafting.

18 varieties of tomatoes transcribed under different levels of salinity in the GH at KAUST



- Salt tolerant tomatoes are grown in the KAUST greenhouse using brackish irrigation water
- Different varieties of tomatoes have been bred for salinity tolerance or hypersaline
- Graftings are being used between salt tolerant rootstocks (such as a Galapagos variety) and commercial tomato plants to produce salt tolerant, high yielding plants with desirable fruits
- Hypersaline tomatoes have higher levels of vitamin C and dissolved sugars, more flavor and a longer shelf life

Aerial Data Aggregation in IoT Networks: Hovering & Traveling Time Dilemma

Osama M. Bushnaq, Abdulkadir Celik, Hesham ElSawy, Mohamed-Slim Alouini, and Tareq Y. Al-Naffouzi
Computer, Electrical and Mathematical Sciences and Engineering (CEMSE) Division, King Abdullah University of Science and Technology (KAUST)

1. Motivation and Background

We study efficient data aggregation from dense WSN using Unmanned Aerial Vehicle (UAV). Since sensors are low cost, simple structured and self-powered, traditional solutions such as direct communication with fixed central unit or observations relaying are not possible. The advancement of rotary-wing UAV can offer a reliable solution for data-aggregation.

3. System Model

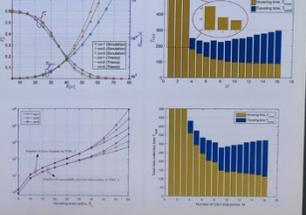


Given M , the Coverage Problem and Travel salesman problem (TSP) are used to find the optimal hovering location and trajectory

$$T_{total} = \sum_{i=1}^M T_{i,hover} + T_{travel}$$

$$T_{i,hover} = \frac{C \cdot S}{M \cdot P \cdot B \log_2(1 + \beta)}$$

Results



Same as P1, except that the constraint $\sum_{i=1}^M B_i(N_i) \geq C$ is replaced with $B_i \leq \delta$

Critical Success Factors



**65 inch screen is
larger than A0
poster**

Critical Success Factors

- A0 size needs to be met or exceeded
- 4K display capability critical
- Internet reliability and back up options (i.e. virtual server)
- Committed and responsive vendor – ePosterslive
- Address local requirements – “split screen” development



Poster Comparison | Undergradu x +

https://epostersonline.com/wepug2019/poster-comparison

Apps | Lenovo | Travel - Lea and Gar... | Natural Health Info... | Yasasii HealthCare... | Yewno Discover | Tr... | Imported From Fire... | Other bookmarks

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Home | Posters by ID | Posters by Title | Authors | Affiliations | **Poster Comparison** |

Poster Comparison

Select a Poster from each drop-down menu and then press "Compare"

Poster 1

Poster 2

WINTER ENRICHMENT PROGRAM JANUARY 13-24, 2019 TIME enrichment.kauit.edu.sa #WEP2019





IMPACT

Library

Support the popularity of scientific posters at KAUST

Ensure comprehensiveness of repository content

Provide space and encourage partnerships supporting research

Opportunities - training and integration with curriculum

Student Success

Prepare students for professional organizations use of ePosters

Promote ORCID iD

Enable citation via persistent URL

Share research efficiently (including via social media)

Preservation

Need to systematically preserve posters in repository

Improve discoverability

Retain KAUST intellectual efforts

Increase Open Access





Reactions

"To be candid, we are thrilled with the opportunity to use the E-poster system. The technology is one thing. The web archive is perhaps even more significant for the mainly young or remote authors at our meeting. Posters are not "second place" entries here. One could even argue that they have a better archival life and better production value than the talks."

David Keyes

*Director Extreme Computing Research Center, AAAS Fellow
Senior Associate to the President*

"This collaboration will be ongoing in alignment with KAUST's Library's goals in relation to the evolution of the scholarly record and "patrons as creators". Our partnership represents an excellent use of both physical and human resources at KAUST, enhancing the professional development of KAUST students who are fortunate to have this tremendous resource available to them".

Kathleen M. Emmenecker

Manager for English Programs



Lessons Learned

- Convenience over Quality – solved by making ePosters convenient!
- Investment in touchscreens is worth it – old screens are used as digital signage
- Vendor commitment and responsiveness is paramount
- The service expands library involvement beyond the building
- Good internal IT support is required
- Involve stakeholders! From as early as possible (e.g. student assessment of various systems in order to get shortlist)
- Look at what is already done – portrait/landscape was a potentially big issue, with A0 portrait the default; changing this has been a challenge.



Lessons Learned

- Change is hard in academia – be prepared for this. We commissioned ‘split screens’ to create a “1-1” experience analogous to printed posters where the number of presenters exceeded our number of screens.
- As service providers, the Library has to adapt rather than expect the organizers or users to do so.
- Go **Big** (A0 equivalent was the KAUST standard, so 65” was required to meet user expectations; 55” wasn’t acceptable).
- Go **High Quality (4K)** to compete with quality of printed equivalent.
- Need ‘lock down’ software (Kioware) to avoid users playing with the screens!
- If possible, do not introduce charges until the service has been accepted.
- Have your own supply of spare parts in order to deal with hardware outages, display stand wheels, power boards etc. This is particularly important when you are at the limit of your available screens.



Lessons Learned

- Screen rental could be an option in large cities.
- Its been challenging getting sufficient notice to utilize the system fully. Hopefully as awareness increases and understanding of the efficiencies gained, we will have more fully optimized events.
- Work with stakeholders who are supportive of the approach e.g. at KAUST we work with our Office of Sponsored Research, who also offered funding should this have been required.
- Encouraging participants to use high resolution images can have repercussion for file size, which directly affects the time taken to load a poster.
- Unwillingness to trial alternative models in use at many international conferences e.g. multiple posters on one 'themed' screen.



Challenges and the Future

- Embarking on this or similar projects; a major challenge is managing change in academia.
- Enhancements available (e.g. password access) and need to be managed and implemented.
- Market and promote relevant eposter modules or apps e.g. review, reporting/ voting
- Remain focused and responsive to user requests (e.g. split screen)
- Seek opportunities linked to student success (e.g. 3D scanning).



Challenges and the Future

- Administrative change needed from organizers e.g. better planning, reducing the 'just in time' approach.
- Optimize engagement dynamics through different models e.g. themed screens.
- Technological advances to improve results and/or manage costs
- Managing service issues – extended hours for staff, spare parts, expanding skill set to support the technology and events.
- Promote content through Open Access.





where inspiration is born

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Thank you



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