



SERVICES AND USE CASES · 2026

See your site, your data and your science in 3D

The KAUST Visualization Core Lab builds digital twins, immersive experiences, simulation visualizations and 3D analysis for organizations across the Kingdom.

help@vis.kaust.edu.sa · wiki.vis.kaust.edu.sa

A KAUST core facility, open to partners in the Kingdom

We help people see complex things: a reef, a storm, an oil reservoir, a fossil, a construction site. For years we did this for KAUST researchers. The same rooms, headsets, software and scientists are available to government entities, developers, cultural institutions, industry and research bodies.

5

facilities: CUBES immersive room, two large display walls, a 3D-projection room and the AR/VR Hub

16+

headsets: HoloLens 2, Apple Vision Pro, Meta Quest 3 and Pro, Vive Pro 2, Vive Focus 3

6

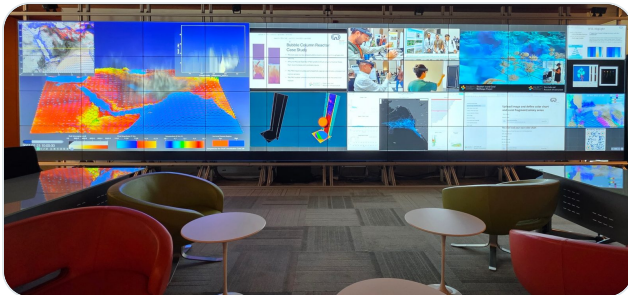
visualization and data scientists, all with doctorates or senior research experience

2

supercomputers we render on: Shaheen III and Ibex



CUBES: 21 stereo panels in a semicircle. A whole delegation experiences the data together.



40-megapixel collaboration wall with shared whiteboard and wireless casting.



AR/VR Hub with headsets, pen tablets and high-end workstations.



A scanned Red Sea reef in CUBES.

Six services. Start with a consultation.

START HERE

Co-designed consultation

Thirty minutes with a visualization scientist. You describe the site, data or event; together we shape the solution, choose the screen that fits your audience, and agree the fastest path to a result.

You get: a one-page recommendation. **Cost:** none.

01

Immersive experiences

Virtual reality, augmented reality and CAVE experiences for exhibitions, launches, briefings and public engagement.

- Life-size AR objects on phones and tablets
- VR walkthroughs on Quest or Vision Pro
- Group experiences in CUBES

Good for: museums, events, ministries, developers.

Typical pilot: 4 to 8 weeks.

02

Digital twins

A navigable 3D model of your site with stations that carry photos, video, documents, dashboards or live web content, on the KVL Digital Twin Platform.

- From your scan, or a drone survey we arrange
- Runs on desktop, VR and CUBES
- Grows as you add sites and data

Good for: heritage sites, campuses, facilities,

construction. **Typical pilot:** 4 to 8 weeks.

03

Simulation visualization

Weather, dust, ocean, flow and reservoir simulations turned into 3D environments for analysts and decision rooms, including while the simulation is still running on the supercomputer.

- Extreme-weather event analysis
- Reservoir and flow models at any scale
- Briefing-room and wall displays

Good for: meteorology, energy, water, environment.

Typical project: 2 to 4 months.

04

3D imaging and analysis

Micro-CT, electron-microscopy and tomography scans segmented, measured and turned into 3D models for reports, simulation, 3D printing or holograms.

- Materials, rocks, fossils, biological tissue
- Avizo and Ilastik workflows
- Expert support and workstation access

Good for: industry R&D, geoscience, museums, health.

Typical project: 2 to 8 weeks.

05

AI and data science

Deep-learning classification and segmentation of images, visual analytics for large datasets, and AI surrogates that make slow simulations real-time, with dashboards to explore the results.

- Image and video analysis pipelines
- Interactive web dashboards
- GPU and supercomputer scale

Good for: environment monitoring, industry, research.

Typical project: 1 to 4 months.

06 • Training and capacity building

Hands-on workshops in visualization tools, Python, high-performance computing, machine learning and deep learning, in English and Arabic, at KAUST or on your premises. Over sixty workshops delivered since 2023.

Shown to ministers, at COP28 and in Riyadh



Life-size AR coral giant, Saudi Environment Week 2025

With SHAMS, a Red Sea coral giant brought to Riyadh as a full-scale augmented-reality experience on phones and tablets. Opened by the Minister of Environment; 2,500 students a day.

Service 01 · Immersive experiences · [Read more: wiki.vis.kaust.edu.sa/highlights/2025/shams](https://wiki.vis.kaust.edu.sa/highlights/2025/shams)



Coral Probiotics Village in VR, COP28

A dive over a real scanned reef with interactive panels, built with the KAUST Marine Microbiomes Lab. Shown at COP28 in Dubai; part of a showcase that won gold at the 2024 Geneva Inventions exhibition.

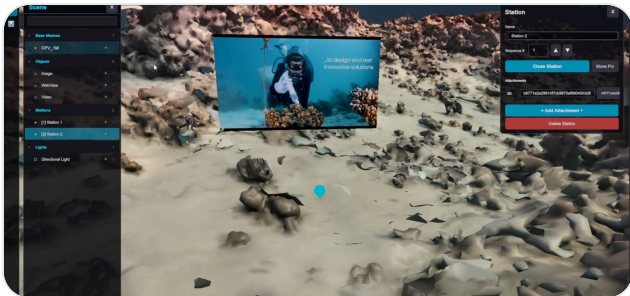
Service 01 · Immersive experiences · [Read more: wiki.vis.kaust.edu.sa/highlights/2023/cpvvr](https://wiki.vis.kaust.edu.sa/highlights/2023/cpvvr)



Holographic climate model, Gordon Bell Prize 2024

A HoloLens app that let the KAUST team present their prize-winning climate emulator in augmented reality on stage and at the conference booth.

Service 01 · Immersive experiences · [Read more: wiki.vis.kaust.edu.sa/highlights/2024/climatemodel](https://wiki.vis.kaust.edu.sa/highlights/2024/climatemodel)



KVL Digital Twin Platform

Load a scanned environment, place stations, attach photos, video, 3D models or any web page inside the 3D space. A new site becomes a twin in days rather than months.

Service 02 · Digital twins · [Read more: wiki.vis.kaust.edu.sa/arvr](https://wiki.vis.kaust.edu.sa/arvr)



KAUST campus from a drone survey

A full drone survey of the campus loaded into the platform. The same pipeline applies to a heritage site, a construction zone or a coastline.

Service 02 · Digital twins · [Read more: wiki.vis.kaust.edu.sa/arvr](https://wiki.vis.kaust.edu.sa/arvr)

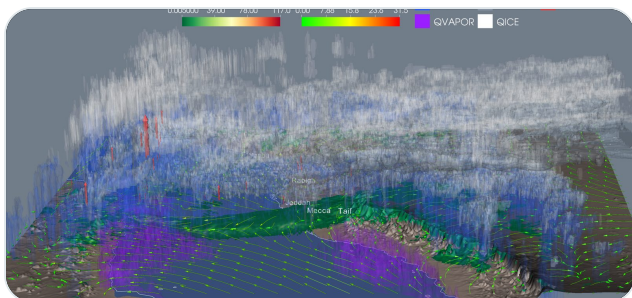


VR lectures across three countries

A neuroscience lecture given inside VR by professors in KAUST, Turin and Doha at the same time, streamed to lecture rooms in two countries.

Service 06 · Training · [Read more: wiki.vis.kaust.edu.sa/highlights/2025/brainawarenessweek](https://wiki.vis.kaust.edu.sa/highlights/2025/brainawarenessweek)

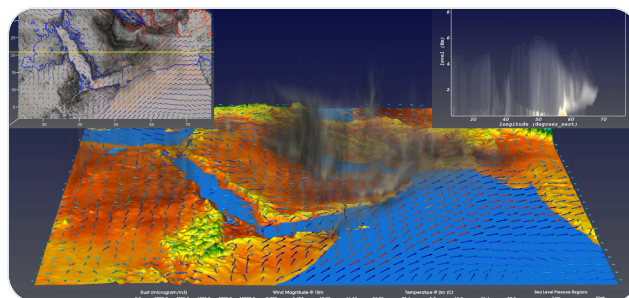
Storms, reservoirs and fossils, made visible



Jeddah extreme rain event, 2022

A visualization environment for weather simulations run on the Shaheen supercomputer, built with the KAUST Climate Change Center to understand how the flood-causing storm formed.

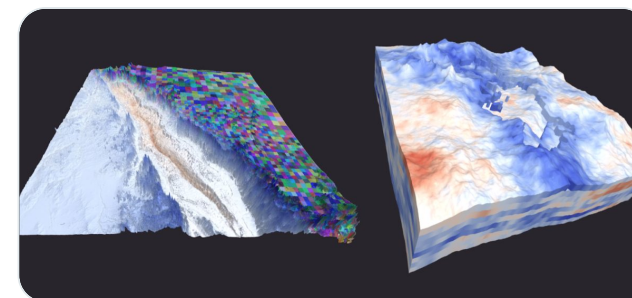
Service 03 · Simulation visualization · [Read more:](https://wiki.vis.kaust.edu.sa/highlights/2023/jeddahrainevent)
wiki.vis.kaust.edu.sa/highlights/2023/jeddahrainevent



Extreme dust storm in 3D

The evolution of a 2018 Saudi dust storm: formation, progression, terrain interaction and atmospheric drivers in one 3D environment for scientists and decision makers.

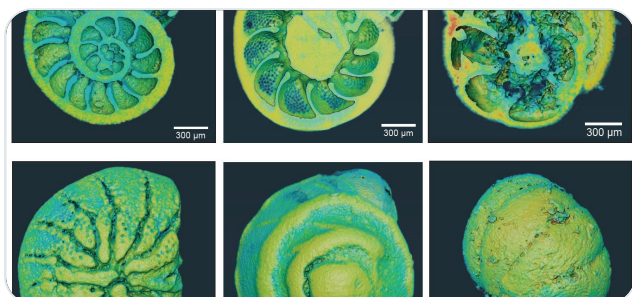
Service 03 · Simulation visualization · [Read more:](https://wiki.vis.kaust.edu.sa/highlights/2025/dustvis)
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Reservoir models with one trillion cells

A real-time visualization system for Saudi Aramco's largest reservoir simulations, developed with the KAUST Visual Computing Center since 2019.

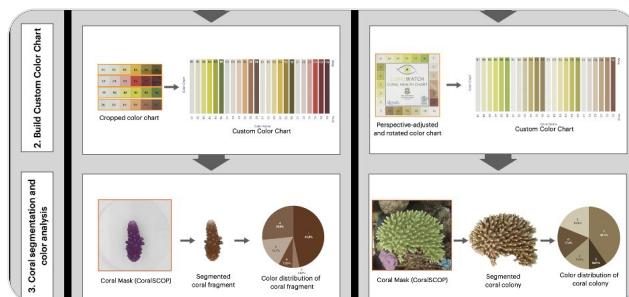
Service 03 · Simulation visualization · [Read more:](https://wiki.vis.kaust.edu.sa/highlights/2023/tcv)
wiki.vis.kaust.edu.sa/highlights/2023/tcv



Micro-CT fossils, holograms and AI classification

Cretaceous fossils from Saudi Arabia scanned, sliced as holograms on HoloLens 2, and classified by deep learning at 95.6 percent accuracy across 12 species.

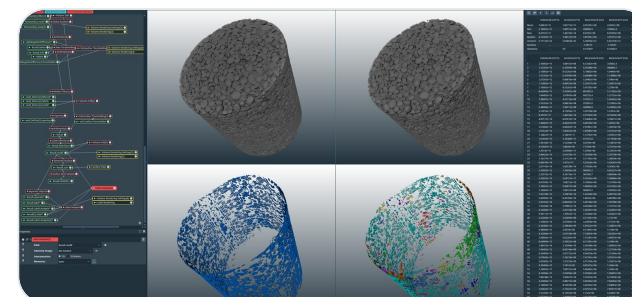
Services 04 and 05 · Imaging and AI · [Read more:](https://wiki.vis.kaust.edu.sa/highlights/2025/arforams)
wiki.vis.kaust.edu.sa/highlights/2025/arforams



Coral-CAT coral health AI

A web tool that scores coral colour from photos against reference charts, matching human assessment closely. Released for the marine-science community.

Service 05 · AI and data science · [Read more:](https://wiki.vis.kaust.edu.sa/highlights/2025/coralcat)
wiki.vis.kaust.edu.sa/highlights/2025/coralcat



Materials and rock imaging in 3D

Segmentation and measurement of micro-CT, SEM and TEM scans: desalination membranes, Red Sea carbonates, brain tissue. 3D geometries handed to simulation codes and publications.

Service 04 · 3D imaging and analysis · [Read more:](https://wiki.vis.kaust.edu.sa/highlights/2025/carbonates)
wiki.vis.kaust.edu.sa/highlights/2025/carbonates

What we would build for you

Five starting points. Each begins with the co-designed consultation and can be piloted on data you already have.

MARINE, CLIMATE & ENVIRONMENT

Reefs, coasts and storms people can see

Reef and seabed twins from survey scans. AR and VR reef exhibits for the public. 3D visualization of rain and dust simulations for forecasters and decision rooms. Coral-health AI from photos.

HERITAGE, CULTURE & MUSEUMS

Sites and artefacts, walk-in and hold-in-hand

Scan-to-twin of heritage and underwater-archaeology sites. Holographic artefact viewers. Digital twins of galleries before opening. Rotating immersive exhibits and science-as-art installations.

GIGA-PROJECTS & EVENTS

Show the plan before it is built

Site twins updated through construction. Investor and visitor walkthroughs on Vision Pro or in CUBES. Immersive pavilion content. Large-display briefing rooms.

INDUSTRY, ENERGY & WATER

Plants, reservoirs and mines in 3D

Large-scale simulation visualization. VR safety and operator training. Immersive review rooms for plant twins. Materials imaging and 3D analysis. AI surrogates for real-time process control.

RESEARCH & EDUCATION

Skills and shared experiences

Workshops in visualization, Python, HPC and deep learning, in English and Arabic. VR lecture halls that connect campuses. Visualization work packages inside research projects.

Why a research lab rather than an agency

- **Science-grade data.** We work every day with photogrammetry, LiDAR, tomography and simulation output, not only marketing models.
- **Every screen in one place.** Test the same content on a headset, a wall and the CAVE in a single visit.
- **KAUST scientists on the same project.** Marine biologists, climate modellers and geoscientists can join the work.



From first call to delivered experience

1

Co-designed consultation

Thirty minutes. You describe the site, data or event; together we shape the solution and choose the screen that fits your audience.

2

Pilot

A focused 4 to 8 week build on data you already have, or a scan we arrange. You get a working demo on a headset, the web or in CUBES.

3

Delivery

The full experience, installation support, training for your staff, and the option to host your delegations in the lab.

4

Ongoing

Content updates, new sites added to the twin, and live data as your programme grows.

How partners engage KAUST

- **KAUST National Transformation Institute.** For ministry programmes, national projects and industry partnerships through the Industry Collaboration Program.
- **KAUST Beacon Development.** KAUST's consulting company, for contracted environmental, marine, geoscience and heritage projects that include a visualization or digital-twin component.
- **Direct with the lab.** For research collaborations and facility access.

Commercial terms are agreed per project through the relevant KAUST channel.

NEXT STEP

Book a consultation and see the lab

Tell us the site, event or dataset. We reply with a recommended path and a date to visit Building 1 at KAUST, or we bring a headset to you.

help@vis.kaust.edu.sa

KAUST Visualization Core Lab · Building 1, Level 2 · Thuwal, Saudi Arabia

Read more

All use cases in detail, with videos: wiki.vis.kaust.edu.sa/highlights

Facilities and AR/VR guides: wiki.vis.kaust.edu.sa/facility_user_guides · wiki.vis.kaust.edu.sa/arvr

Services overview: kvl-partners.pages.dev

