The Eye Hackathon

In collaboration with **SDAIA**
الهيئة السعودية للبيانات
والذكاء الاصطناعي
Saudi Data & AI Authority

📅 **12-14 December 2024**

PROGRAM
BOOKLET

@KkeshKsa

📍 crowne plaza RDC

**Where Human Vision
Meets Machine Precision**

The Eye Hackathon

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CEO Welcome Note

Dear Participants,
It is with great excitement that I welcome you to The Eye Hackathon, a key highlight of the **King Khaled Eye Specialist Hospital & Research Center (KKESH&RC) International Conference (KKESH 2024)**. This year's event continues our legacy of advancing eye care by embracing emerging technologies that shape the future of ophthalmology.

At KKESH, we are deeply committed to fostering innovation and collaboration to enhance patient care. This year, we are honored to partner **with the Saudi Data and Artificial Intelligence Authority (SDAIA)** to explore how artificial intelligence can revolutionize the diagnosis and treatment of eye diseases. Together, we aim to unlock new possibilities for improving vision care across the globe.

The Eye Hackathon is a unique platform for eye care professionals, data scientists, and AI experts to converge and tackle real-world challenges in ophthalmology. It is a space where interdisciplinary collaboration sparks innovative solutions to some of the most pressing problems in eye care.

I am delighted to announce that this year's hackathon features **15 dynamic teams and 100 passionate participants**. Over the course of the event, these teams will work tirelessly to address critical challenges in eye care, showcasing the power of collaboration and creativity.

Thank you for being part of this transformative experience. We look forward to witnessing the groundbreaking ideas and solutions that emerge from this inspiring event.

Warm regards,
Abdulaziz AlRajhi, MD

Dr. Abdulaziz AlRajhi
Chief Executive Officer
King Khaled Eye Specialist Hospital & Research Center

Innovating Sight, Empowering Insight

HACKATHON OVERVIEW

Organized by King Khaled Eye Specialist Hospital & Research Center (KKESH&RC) in collaboration with the Saudi Data and Artificial Intelligence Authority (SDAIA), The Eye Hackathon is a groundbreaking event bringing together eye care specialists and artificial intelligence experts to create cutting-edge AI solutions that transform eye care. Over three action-packed days, participants will collaborate, compete, and innovate to address real-world challenges in ophthalmology, with a focus on leveraging artificial intelligence and data-driven approaches.

Foster Innovation: Develop creative AI-driven solutions in ophthalmology.

Enhance Collaboration: Foster teamwork across disciplines to solve challenges.

Improve Eye Care: Advance the standards of ophthalmic diagnosis and treatment.

Drive Impact: Create scalable solutions that improve patient outcomes.

Join us at the Eye Hackathon to contribute to the future of eye care innovation!

Organizing Committee

Dr. Adi Al Owaifeer

CHAIRMAN

Consultant, Innovation Office
King Khaled Eye Specialist Hospital & Research Center

MEMBER

Dr. Mohammed Al Awwad
Senior AI Expert
Saudi Data & AI Authority

Eng. Mansour AlDammas
Chief IT Officer
King Khaled Eye Specialist Hospital &
Research Center

Dr. Mansour AlDawood
IT Infrastructure Director
King Khaled Eye Specialist Hospital &
Research Center

Mr. Khaled Al Dhayaan
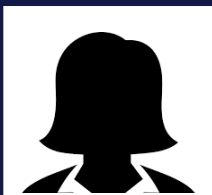General Manager ecosystem & projects
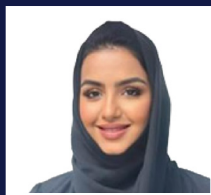Saudi Data & AI Authority

Medical Student
King Faisal University

Mr. Abdulaziz Al Ruwaishid
Coordinator, Innovation Office
King Khaled Eye Specialist Hospital &
Research Center

Ms. Lujain Al Yahya
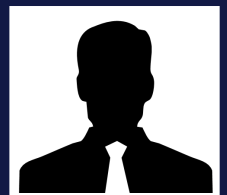Senior Project Manager
Saudi Data & AI Authority

Ms. Fatimah Al Hashmi
Event Acting Manager
King Khaled Eye Specialist Hospital &
Research Center

Mr. Sami Al Anazi
Public Relations Manager
King Khaled Eye Specialist Hospital &
Research Center

Mr. Abdulaziz Al Bilali
Marketing Department Manager
Saudi Data & AI Authority

Scientific Committee

Dr. Adi Al Owaifeer

CHAIRMAN

Consultant, Innovation Office
King Khaled Eye Specialist Hospital & Research Center

MEMBER

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Dr. Mansour Al Dawood
IT Infrastructure Director
King Khaled Eye Specialist Hospital &
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Assistant Professor, Computer Science
King Abdulaziz University for
Health Sciences

Dr. Ibrahim Al Obaida
Consultant, Glaucoma Division
King Khaled Eye Specialist Hospital &
Research Center
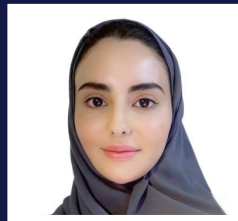
Dr. Deema Jomar
Consultant, Anterior Segment Division
King Khaled Eye Specialist Hospital &
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Eng. Ali Al Talag
King Khaled Eye Specialist Hospital &
Research Center

Mr. Abdulaziz Al Ruwaishid
Coordinator, Innovation Office
King Khaled Eye Specialist Hospital &
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Data Management Committee

Dr. Mansour Al Dawood
CHAIRMAN
IT Infrastructure Director
King Khaled Eye Specialist Hospital & Research Center

MEMBER

Eng. Ali Al Talag
Acting IT Quality and Data Manager
King Khaled Eye Specialist Hospital &
Research Center

Eng. Omar Ateen
System Analyst Team Lead
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Eng. Bader AlOtaibi
Network and Systems Manager
King Khaled Eye Specialist Hospital &
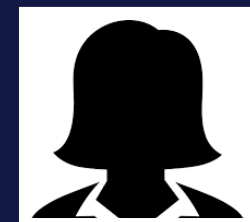Research Center

Eng. Abdulrahman Alnaddaf
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Artificial Intelligence Advisors

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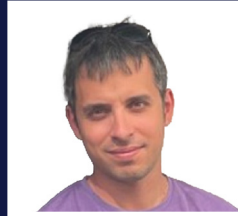
Dr. Ahmet Görkem
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Board-Certifications in Radiation Oncology
and Medical Computer Science
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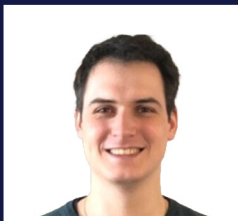
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Dr. Sadam Al-Azani
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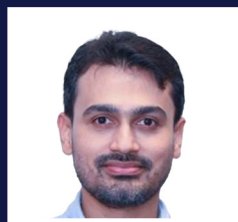
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Clinical Advisors

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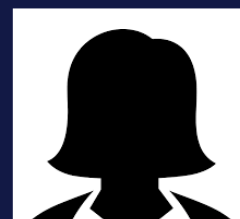
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King Khaled Eye Specialist Hospital &
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Team Coordinators

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King Fahad Hospital, Al Baha Health Cluster

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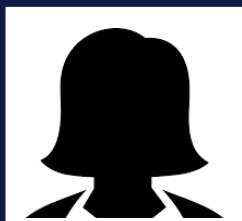
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Medical Student, College of Medicine
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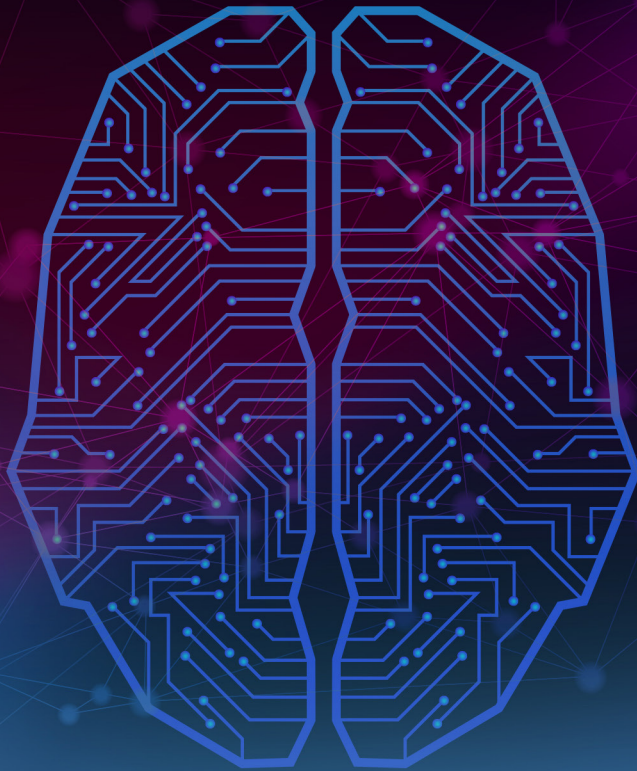
Where Curiosity
Sparks Innovation

The Eye Hackathon

Program at a Glance

Day Time	Day 1 **Thursday** 12 **Dec** 2024	Day 2 **Friday** 13 **Dec** 2024	Day 3 **Saturday** 14 **Dec** 2024
08:30 – 09:00	Lectures		
09:00 – 09:30	Lectures		
09:30 – 10:00	Hacking	Lectures	Pitch Prep
10:00 – 10:30	Hacking	Lectures	Pitch Prep
10:30 – 11:00	Coffee Break	Lectures	Pitch Prep
11:00 – 11:30	Hacking	Mentor Moment	Mentor Moment
11:30 – 12:00	Hacking	Prayer & Lunch	Coffee Break
12:00 – 13:00	Prayer & Lunch	Prayer & Lunch	Pitch Battle
13:00 – 13:30	Lectures	Hacking	Pitch Battle
13:30 – 14:00	Mentor Moment	Hacking	Pitch Battle
14:00 – 15:00	Hacking	Hacking	Pitch Battle
15:00 – 15:30	Coffee Break	Coffee Break	Award Ceremony
15:30 – 16:00	Hacking	Hacking	
16:00 – 17:00	Hacking	Hacking	
17:00 – 17:30	Hacking	Mentor Moment	
17:30 – 18:00	Wrap-up Rounds	Wrap-up Rounds	

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COLOR CODES

Organizing Committee	Lecture	Mentoring	Team work

DAY ONE
THURSDAY 12 DEC 2024

Time	Session	Speaker
08:30 – 08:35	Introduction	Dr. Adi Al Owaifeer
08:35 – 08:40	Welcome Note	Abdulaziz AlRajhi, MD
08:40 – 08:50	Launch Pad: Hackathon overview	Abdulaziz Al Ruwaishid / Renad Al Subaie
08:50 – 09:10	Expert Insight: Building an Effective AI Solution in Eye Care (The EYENAI Experience)	Dr. Mohammed Al Awwad
09:10 – 09:30	Hacking	
09:30 – 10:30	Coffee Break	
10:30 – 11:00	Hacking	
11:00 – 12:00	Prayer & Lunch Break	
12:00 – 13:00	Expert Insight: Kickstart Your AI Project: Public Ophthalmology Datasets	Dr. Aaron Lee
13:00 – 13:15	The Innovation Dialogue: An Expert's Reflections on Transforming Eye Care with AI	Dr. Daniel Ting
13:15 – 14:00	Mentor Moment	Clinical & AI advisors
14:00 – 15:00	Hacking	
15:00 – 15:30	Coffee Break	
15:30 – 17:30	Hacking	
17:30 – 18:00	Wrap-up Rounds	Organizing Committee

The Eye Hackathon

COLOR CODES

Organizing Committee	Lecture	Mentoring	Team work

DAY TWO
FRIDAY 13 DEC 2024

Time	Session	Speaker
09:30 – 09:40	Scoring Success: Hackathon Assessment Criteria	Abdulaziz Al Ruwaishid
09:40 – 11:00	Data Dive: AI Lecture/Workshop	Stanford Speaker
11:00 – 11:30	Mentor Moment	Clinical & AI advisors
11:30 – 13:00	Prayer & Lunch Break	
13:00 – 15:00	Hacking	
15:00 – 15:30	Coffee Break	
15:30 – 17:00	Hacking	
17:00 – 17:30	Mentor Moment	Clinical & AI advisors
17:30 – 18:00	Wrap-up Rounds	Organizing Committee

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COLOR CODES

Organizing Committee	Lecture	Mentoring	Team work

DAY THREE
SATURDAY 14 DEC 2024

Time	Session	Speaker
09:30 – 11:00	**Pitch Prep:** Teams sit down to refine and finalize presentations	
11:00 – 11:30	**Mentor Moment**	**Clinical & AI advisors**
11:30 – 12:00	**Coffee Break**	
12:00 – 15:00	**Pitch Battle:** Final presentations of developed solutions	**Judging Panel**
15:00 – 15:30	**Announcement of Winners**	

From Data
to Diagnosis

Hackathon Teams

NO. 1
IFRESH

AI app detects and manages dry eye by analyzing blinking redness and rubbing through the phones front camera. It offers dry eye grading tests personalized medical advice and daily reminders for moisturizing and eye care.

MEMBERS	CLINICAL ADVISOR
Dr. Rawan Alabduqader	Dr. Deema Jomar
Dr. Jumanah Qedair	**AI ADVISOR**
Eng. Nouf Alabdulqader	Dr. Abdulrahman Aljouie
Mr. Abdullah Afif Alshakhs	**COORDINATOR**
Mrs. Haya saud Alowais	Dr. Abdulmaje ed Al Khathami

NO. 2
GLAUCOMA GURUS

Framework for multi-model deep learning system for glaucoma diagnosis and management including surgical predictions that analyzes multi-source data OCT fundus images visual field tests patient records genetic data and treatment histories.

MEMBERS	CLINICAL ADVISOR
Dr. Yara Alshammari	Dr. Ibrahim AlObaida
Dr. Nora Alkhaldi	**AI ADVISOR**
Dr. Mohammed Fouda	Dr. Alexander Thieme
Mr. Hatem Alhomid	**COORDINATOR**
Dr. Arij Alshammari	Dr. Abdulmajeed Al Khathami

Hackathon Teams

NO. 3
STITCH SMART

Creating an AI tool that analyzes photos of corneal suturing/surgical suturing and provides feedback to trainees, guiding them on areas that need improvement.

MEMBERS	CLINICAL ADVISOR
Dr. Alanuad Ibrahim Albazei	Dr. Rizwan Malik
Eng. Mohamed adel Alzaben	**AI ADVISOR**
Ahmed Abdullah Albin hamad	Dr. Chris Sadeé
Faisal abdo Alajam	**COORDINATOR**
Razan Abdulaziz Almulhim	Dr. Mona Almutlaq
Eng. Njood Ebraheem Aljuraid	

NO. 4
THYROID EYEAI

Creating an AI tool that can read predictors of DON on radiological imaging and refer the patient for ophthalmology care.

MEMBERS	CLINICAL ADVISOR
Eng. Mohamed adel Alzaben	Dr. Khawlah Alzaben
Wajd Fahad Aldugaim	**AI ADVISOR**
Wajd Abdullah Alsulaiman	Dr. Shujaat Khan
Eng. Omar Mohammed Alharbi	**COORDINATOR**
Eng. Danah Adel Almudaifer	Dr. Mona Almutlaq

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NO. 5
KONE AI

An AI-powered system to predict keratoconus progression at first visit. By analyzing corneal topography & risk factors to identify high-risk patients early, enabling timely intervention, supporting decision-making for clinicians and preserve vision.

MEMBERS	CLINICAL ADVISOR
Dr. Enmar Mazyad Almazyad	Dr. Ali AlRajhi
Eng. Shaimaa Mishal Alghamdi	**AI ADVISOR**
Eng. Raniyah Mishal Alghamdi	Dr. Chris Sadeé
Eng. Khuzama Khalid Alsenan	**COORDINATOR**
Eng. Ibrahim Abdulrahman Alshehri	
Eng. Joharah Faiz Alotaibi	Dr. Nujood Alhomeni

NO. 6
OPTIC AI PIONEERS

The mobile app uses AI and sensors to monitor a child's adherence to covering the stronger eye during digital device use for amblyopia treatment. It sends real-time notifications to parents and generates compliance reports for doctors.

MEMBERS	CLINICAL ADVISOR
Alhassan Rizq Alqarih	Dr. Amani AlBakri
Haifa Hussein Alnajrani	**AI ADVISOR**
Hend Abdullah Al Jaffar	Dr. Katherine Hartmann
Razan yahya alnajrany	**COORDINATOR**
Dr. Manal Abdullah Almuammar	Dr. Nujood Alhomeni

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NO. 7

A-EYE TRIAGE

An AI-powered triage system for ophthalmic emergencies analyzes symptoms and eye images to prioritize cases, provide diagnoses, and offer pre-hospital care recommendations, ensuring timely treatment and improved efficiency.

MEMBERS	CLINICAL ADVISOR
Dr. Tasniem Alyahya	Dr. Halah BinHelayel
Dr. Tadani Alyahya	**AI ADVISOR**
Reaam Alyahya	Dr. Sadam Al-Azani
Munirah Alyahya	**COORDINATOR**
Amal Alsulamy	Dr. Maryam Alqudihi

NO. 8

DEEPROP

The project develops a deep learning system to diagnose and monitor Retinopathy of Prematurity (ROP) using fundus images. It detects disease severity, tracks progression, and supports timely interventions, improving outcomes for premature infants through accurate AI analysis.

MEMBERS	CLINICAL ADVISOR
Faisal Maher Mahrous	Dr. Sulaiman AlSulaiman
Sami Alghamdi	**AI ADVISOR**
Dr. Hissah AlTurki	Dr. Sadam Al-Azani
Eng. Noura Alsaqr	**COORDINATOR**
Eng. Hesham Banafa	Dr. Maryam Alqudihi
Leen Aljrewi	

Hackathon Teams

NO. 9
NEURO CUE

NeuroCue combines OCT retinal analysis with AI-driven assessments of thecognition for early Alzheimer's detection. It bridges diagnostic gaps, enabling holistic evaluation, early intervention, and better cognitive health outcomes.

MEMBERS	CLINICAL ADVISOR
Dr. Raghad Mutir Alzahrani	Dr. Sawsan Nowilaty
Eng. Ibrahim Saber	**AI ADVISOR**
Dr. Fay Mana Alsuhayam	Dr. Abdulrahman Aljouie
Dr. Renad Youssuf AlSuhaibani	**COORDINATOR**
Ahad faheed Alotaibi	Dr. Ibitsam Algouf

NO. 10
CLEAR SIGHT

The project develops an AI-based system to analyze eye images for early cataract detection and severity classification, aiding doctors in treatment decisions. It improves diagnostic accuracy and reduces costs, enhancing healthcare quality.

MEMBERS	CLINICAL ADVISOR
Shatha Alhazzani	Dr. Deepak Edward
Reema Alshawi	**AI ADVISOR**
Alanoud Alhmood	Dr. Sadam Al-Azani
Shaikha Mokhlis	**COORDINATOR**
Dr. Abdullah Almalki	Dr. Ibtisam Algouf

Hackathon Teams

NO. 11
ECHO VISION AI

An AI-powered solution for ophthalmic B-scan interpretation employs machine learning to assist clinicians in diagnosing key eye conditions, addressing challenges like a shortage of skilled doctors, lack of expertise during on-call shifts, and diagnostic delays.

MEMBERS	CLINICAL ADVISOR
Dr. Abdulrahman AlKaff	Dr. Abdulrahman AlGaeed
Aisha Ali AlKaff	**AI ADVISOR**
Abdullah Althobaiti	Dr. Shujaat Khan
Dr. Samar Binkheder	**COORDINATOR**
Eng. Habib Rebai	Dr. Ibtisam Algouf

NO. 12
SIGHT SCRIBE

AI-Powered Ophthalmic Medical Note Generation: Leverage AI to automatically transcribe and categorize patient conversations into standardized Ophthalmic medical notes sections.

MEMBERS	CLINICAL ADVISOR
Asma Alahazmi	Dr. Aziza Alanazi
Alaa Alahazmi	**AI ADVISOR**
Arwa Alahazmi	Dr. Abdulrahman Aljouie
Abdullah Alahazmi	**COORDINATOR**
Dr. Leema Alhussayen	Dr. Muath Alahmadi

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NO. 13

VISION SCAN AI

AI-powered app using photorefraction to detect refractive errors (myopia, hyperopia, astigmatism) via phone camera. It offers vision tests, light reflection analysis, and detailed reports with treatment advice for hospitals and online consultations.

MEMBERS	CLINICAL ADVISOR
Mashael Alzahrani	Dr. Alyaa Ezzat
Maryam Alharby	AI ADVISOR
Yousef Alnumani	Dr. Katherine Hartmann
Naif Alsharari	COORDINATOR
Mariyyah alrasheed	Dr. Muath Alahmadi

NO. 14

BASEERA

Baseera leverages AI and AR to turn smartphones into accessible eye-testing tools for everyone. It facilitates early detection of vision issues such as myopia, hyperopia, and astigmatism, providing accurate, instant results to promote better eye health worldwide.

MEMBERS	CLINICAL ADVISOR
Eng. Taghreed Alghamdi	Dr. Mohammed AlBlowi
Eng. Eman Alrasheed	AI ADVISOR
Eng. Abdullah Bin Muqbil	Dr. Alexander Thieme
Eng. Rana Alsubaie	COORDINATOR
Dr. Tasneem Alotaibi	Dr. Osama M. Qasim

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NO. 15
TUWAIQ

Keratoconus is more prevalent in the Middle East, especially Saudi Arabia. This project aims to develop a machine learning model to predict keratoconus recurrence and high astigmatism (>4- diopters) during a two-year follow-up after keratoplasty.

MEMBERS	CLINICAL ADVISOR
Dr. Norah Abdullah Bin Dakhil	Dr. Mohammed Ahad
Razan Abdullah Bin Dakhil	**AI ADVISOR**
Lujain Abdullah Bin Dakhil	Dr. Shujaat Khan
Dr. Atheer Mohammed Alhumud	**COORDINATOR**
Dr. Khulood Yahya Alyahya	Dr. Osama M. Qasim

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