

Science Council presents its active initiative on the Medical Imaging and Data Resource Center MIDRC (midrc.org)

- MIDRC was created to address the COVID-19 pandemic through the collection and analysis of medical images, which have an essential clinical role in the diagnosis, triaging, monitoring, and management of the disease.
- MIDRC is a multi-society, multi-institutional, NIBIB-funded initiative that is accelerating the creation of an open, fair, and diverse medical imaging data commons as well as transfer knowledge and innovation of AI within the imaging community, including clinical problem identification, discovery, development, evaluation, translation, implementation and dissemination.

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- medicine and the **leadership role of medical physicists** and the AAPM along with ACR, RSNA, and NIH.
- AAPM brings its expertise in
 - physical image quality/harmonization and
 - tailored distribution/metrology standards/evaluation metrics.
- MIDRC represents a flagship AAPM initiative and Science Council is using MIDRC as a model for upcoming new initiatives.
- This talk continues the discussion from AAPM 2021 Joint Council Symposium.
 - View the 2021 recording for history of DSC and MIDRC

 AAPM Science Council: Examines specific areas of medical physics to determine advancement mechanisms, addresses scientific questions, and collates and assesses data.

 SC Data Science Committee: DSC is a committee of the Science Council and aims to coordinate, steer and organize AAPM efforts in the fields of Big Data, Radiomics, Machine Learning, and related areas.

 AAPM's participation in MIDRC: Natural extension of AAPM's Science Council through expertise drawn from DSC, as well as TAC & RSRCH

 MIDRC is positioned within AAPM as a subcommittee under DSC

 physical image quality/harmonization



Medical Imaging Community Response to the COVID-19 Pandemic Established August 2020 Medical Imaging and Data Resource Center (MIDRC) Supported by NIBIB NIH National Biomed AMERICAN ASSOCIATION of PHYSICISTS IN MEDICINE ACR RSNA CHICAGO A <u>cur</u> AAPM PIs: mons
 Enab Maryellen Giger stopics no single image archive A collaboration of 24+ institutions & 100+ investigators from academia, comunity practices, FDA, ^{coulc} Paul Kinahan A partnership of the AAPM, ACR and RSNA, supported by NIBIB and hosted at University of Chicago and others • Two scientific components of MIDRC: 8.8 20 1. Open Discovery Data Commons • • creation, testing, quality assurance, and data connectivity 2. Machine Intelligence Computational Capabilities More information at clinically relevant algorithms and software tools Booth #1085

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A.	MIDRC: <u>Building the Infrastructure</u>	
MIU	(Technology Development Projects)	Four MIDRC Data Science Subcommittees
T f c 1	he MIDRC infrastructure and processes is created through we Technology Development Projects, which are conducted ollaboratively: Creating an open discovery platform for COVID-19 imaging and associated data (led by RSNA).	DSIT - Data Standards and Information Technology Subcommittee Ied by RSNA
2	 Creating a real-world testing and implementation platform with direct real-time connections to health care delivery organizations (led by ACR). 	DPP - Data Policy and Procedures Subcommittee led by ACR
3	 Developing and implementing quality assurance and evaluation procedures for usage across the MIDRC (led by AAPM). 	 DQH - Data Quality and Harmonization Subcommittee
4	 Enabling data intake, access and distribution via a world- facing data commons portal (led by all three plus Gen3). 	 led by AAPM DSUP – Data Search and
5	 Linking the MIDRC to other clinical and research data registries (led by all three plus Gen3). 	User Portal Subcommittee Ied by Gen3
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Review some of the unique and special attributes of MIDRC



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M. Curation & harmonization of DICOM images and meta-data MIDRC Multiple DICOM study descriptions from incoming MIDRC data AAPM leaders: to a unique LOINC code earching on Gen3 user portal for cohort Paul Kinahan 8 John Boone from DICOM Metadata to LOINC codes Tony Siebert Andrey Fedorov Genil data model Cohort Explorer Subset of a public COVID-19 Nicholas Bevins chest x-ray image collection Dan Sullivan variations in image quality and view Manifest Links to images Optional adjustment o deidentification profile Abstraction INC code DCOM inage GetL DECOM Inage Set Further de-identification CTF/ TRAD Gever • Review directions and body part (i.e. the knee image near center) agend DECOM Service Char class



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MIDRC Grand Challe	nge Work Group		
 Created to coordinate effort on all aspects of challenges Potential to merge top performing algorithms to benefit the common good 			
Beta Challenge Zero involved radiographic images as 'frontal the process of participants sub with other functionality, on the	AAPM leaders: Sam Armato Karen Drukker Lubomir Hadiiyski	ng chest s-test" s, along	
MIDRC Challenge One, planne annotated MIDRC chest X-rays,	Jayashree Kalpathy-Cramer	VID +/-).	





 MDRC as a National Resource

 Status

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