



Onward Assist

Enabling Better Outcomes

Presentation at GCCW 2021

Dinesh Koka, CoFounder & CEO
dinesh@onwardhealth.ai



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Onward Assist

Onward Assist is an **advanced healthcare analytics platform,**

powered by *Computer Vision and ML-based algorithms*

for **Automated diagnostics and Treatment decision support,** to enable

Pathologists, Radiologists & Oncologists



Workflow Software



Pathflow Dx – Digital Pathology

Digital Pathology workflow platform that enables

Labs and Pathologists to leverage Digital pathology and

manage workflow for timely turnaround of case

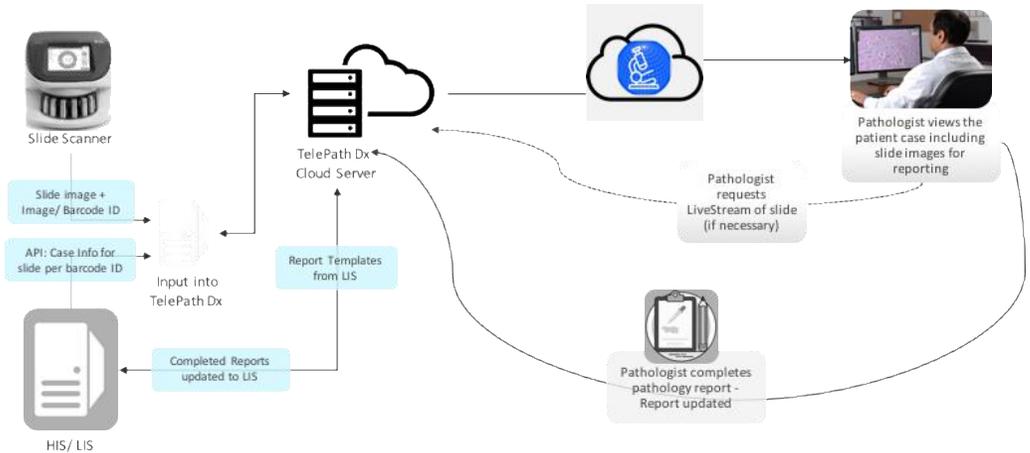
reporting, better productivity of Lab and pathologist

resources

VALUE PROPOSITION

- ✓ Helps the Lab **achieve the desired Turnaround time**
- ✓ Pathologist can report in a timely manner from their own location for **remote reporting**
- ✓ Image Stitching, easy-to-use manual slide scanning
- ✓ **Live teleconsultation** & second opinion

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- ✓ Targeted at Pathology hub-and-spoke service providers, Diagnostic lab networks, Hospital Labs

Now being piloted at Large Academic Medical Center in the US | And implemented at one of the largest Diagnostics networks in India – Connecting 25 centers

DATA MANAGEMENT & STANDARDS

TelePath Dx is a CE marked software product



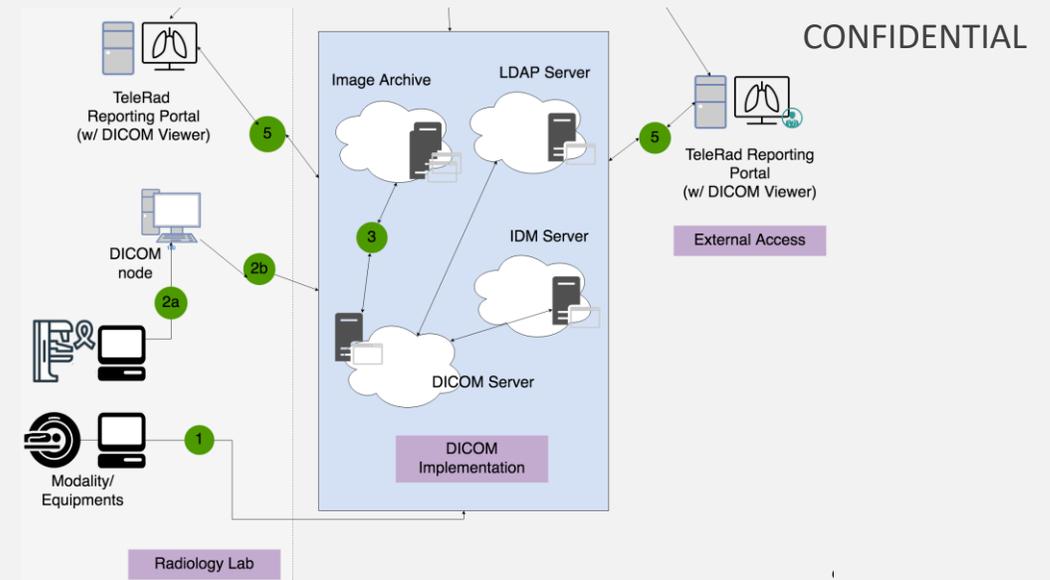


RADFLOW DX

Cloud-based TeleRadiology platform for distributed viewing and reporting. Comprehensive radiology review and reporting workflow solution, with inbuilt tools for reporting templates, as well as admin dashboards and analytics tools

VALUE PROPOSITION

- ✓ Customizable, low maintenance radiology platform
- ✓ Smart study distribution helps centers customize and automate workflow
- ✓ Built-in patient portal for study access
- ✓ Stay protected against rising infrastructure costs



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- ✓ Diagnostics Centers, Hospital Radiology Departments
- ✓ Teleradiology service providers, Hub-and-spoke radiology networks

Now available: Plug and play deployment of distributed radiology workflow software and PACS

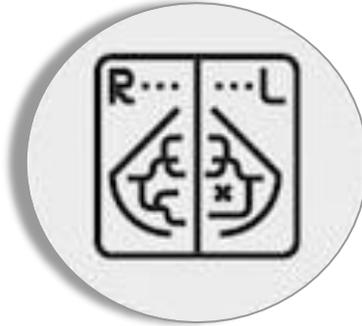
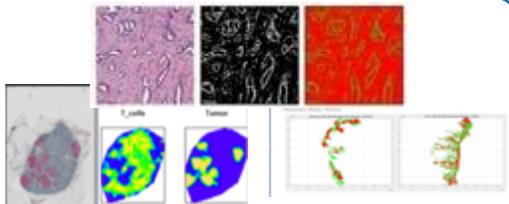
Imaging Analysis & AI

Product Lines



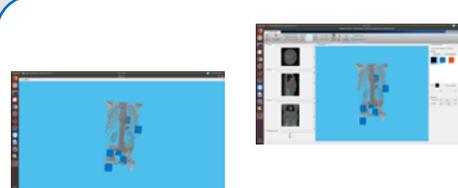
Path-Assist

- Automated screening
- Multiple Pathologies
- Tumor detection, IHC



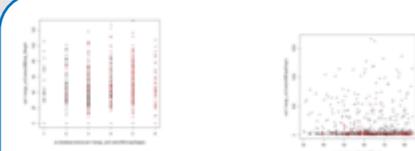
Rad-Assist

- Covid19 (Xray and CT)
- Mammography screening
- Tumor tracking (RECIST)



TumorBoardAI

- Treatment Decision assistance
- Patient data analytics



Pathology - Capabilities include

1. Cancer diagnostics – Ca-Breast, Ca-Cervix

- Detection, Classification (Benign/ malignant), Grading/ Subtyping

2. Advanced Capabilities

- Process each cell to determine various properties, such as shape , texture, color distribution features, Spatial distribution of cells
- Tumor microenvironment analysis, Estimation of survival/ readmission

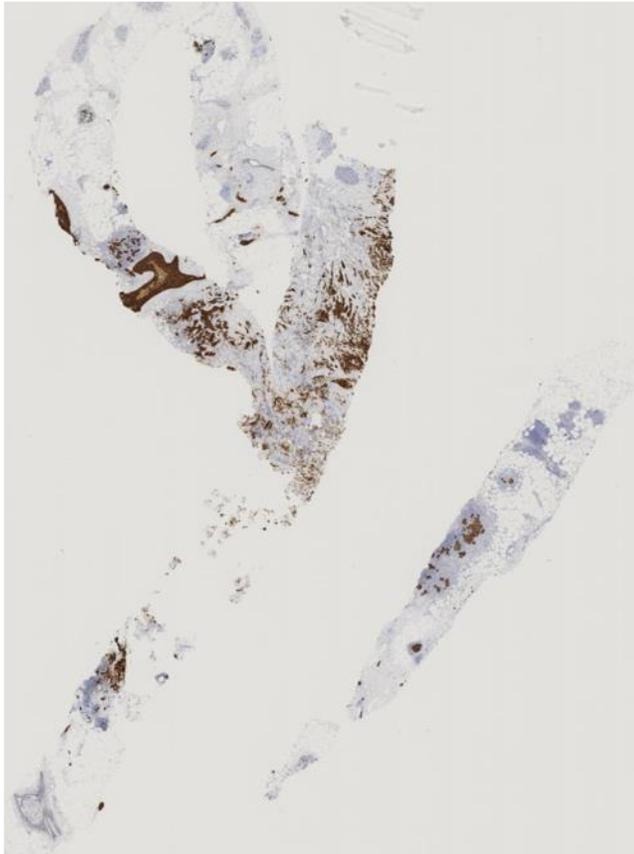
3. Clinical decision support

- Cluster patients into groups based on their risk score similarity

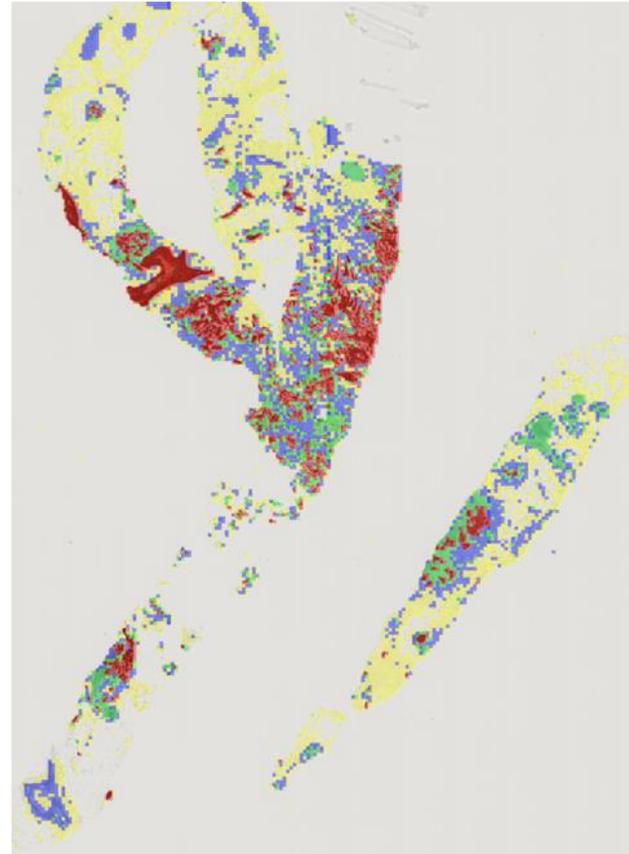


Path Assist: Tool Demo

Input Image



Tool Output

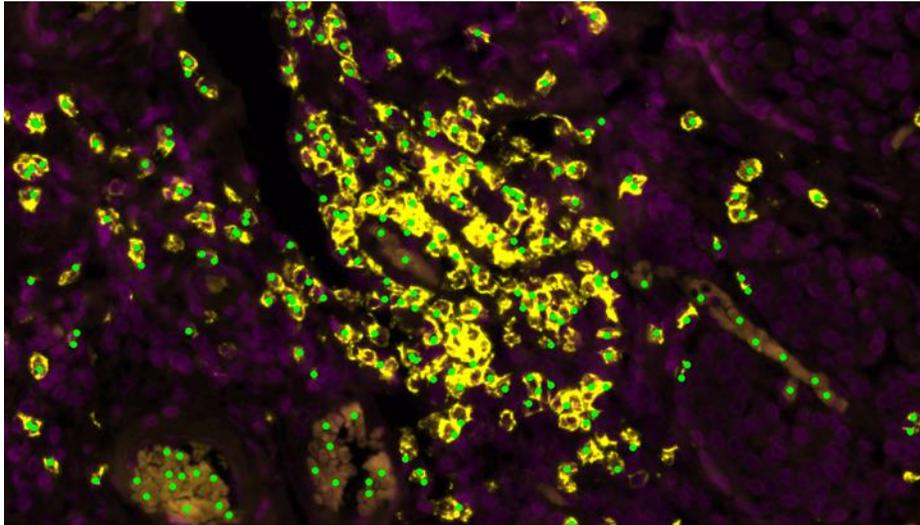


HER2
Scoring

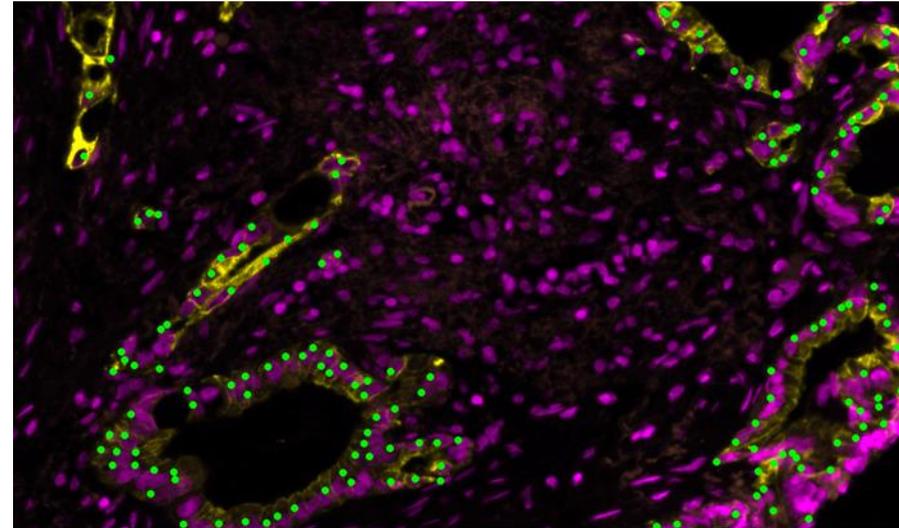


Path Assist: Tool Demo

Multiplexed Image Analysis



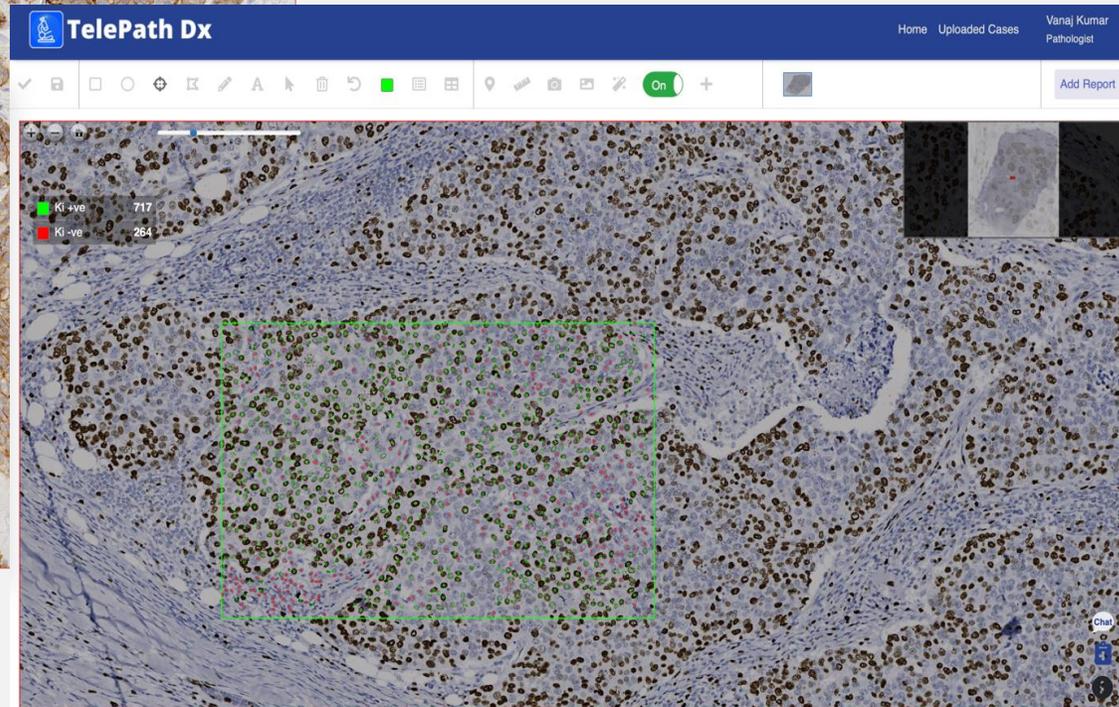
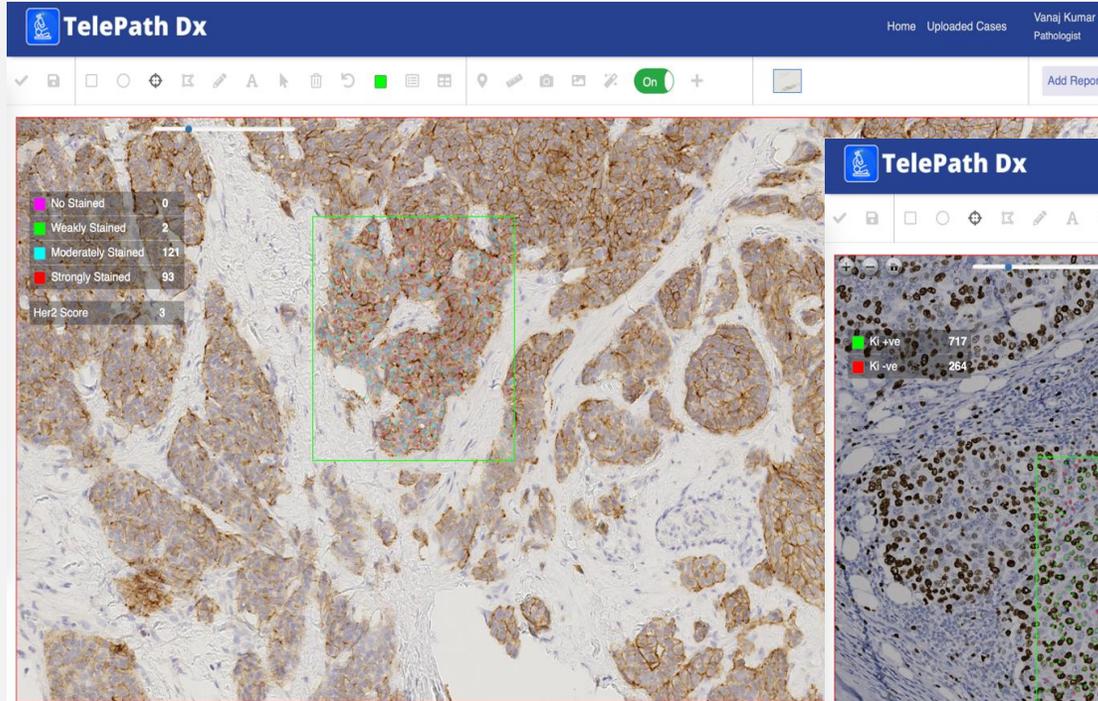
CD8: T CELLS



PANCK: TUMOR CELLS



Path Assist: Tool Demo



RESULTS, GLOBAL BENCHMARKING

- IEEE TMI: Onward Assist part of MoNuSAC2020 paper published in [IEEE TMI](#): June '21
- ML work presented at [Pathology Visions 2020](#) (global digital pathology conference), Oct '20 on: Deep Learning Based Mitoses Recognition and Concordance Study With Pathologists
- Onward Assist's algorithm ranked 11th among global teams for Automated MSI classification in colorectal cancer in the [PAIP 2020 Grand Challenge](#) international competition
- Onward Assist was ranked in the Top 15 among Global teams – [MonuSac 2020 Grand Challenge](#): Global challenge focused on AI enabled characterization of tumor and its microenvironment, including detection of different cell types
- Use of GANs in Histopathology diagnostics featured at the Global NVIDIA conference [GTC 2020](#) – Lymph-node Classification - "Improving classification of lymph node histopathology patches using SSC-GAN"
- Featured at TCGA conference, September 2019 on Prostate Grading - "Global Labels based Autoencoder REpresentation-Convolutional Neural Network (GLARE-CNN) for automatic tumor stage (T) classification on whole-slide images of prostate cancers"
- Abstract submitted and presented at HAP Conference, Aug'19 alongwith Apollo Hospitals

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1. Tumor segmentation using our own modified resnet/chowder network method
2. Image quality detection and adaptive super resolution for post processing images
3. HER2 scoring using own classical computer vision techniques
4. Multiplex imaging - tumor microenvironment assessment using computer vision methods
5. Mitosis detection - combination of classical computer vision + deep learning for Mitosis detection and counting
6. Semi-Supervised Classification-GAN on histopathology images for data augmentation and improving classification accuracy



RAD-ASSIST

Radiologist Assistant tool

- Lung Nodules Detection on Chest Xray
- Mammography analysis for Tumor detection and ID
 - Identify as Benign and Malignant, Separate Cancer from normal
 - Tumor contour, image registration
- Tumor Tracking tool for treatment decision support
 - RECIST scoring for accurate estimate of tumor response
 - Cross-modality analysis for Oncologists/ Tumor board



Recognitions

- Jan '21: Winner, Amazon AI Conclave
- Dec '20: GE Edison Startups
- Nov '20: Winner, Nasscom Emerge 50 2020
- Apr '20: Top 50 AI startups, India AI Landscape report
- Feb '20: Winner, Microsoft EmergeX
- Jan '20: LIF Fellow, Royal Academy of Engineering London
- Oct '19: Winner, Startup Award – NHA-Ayushman Bharat,
- June '19: Member, Yale Sustainable Health Initiative
- Nov '18: Top 6 Startups – AEA Conference 2018, Japan
- Aug '18: Winner, RICH Cancer Innovation Challenge
- Jul '18: Winner, Best Technology Innovation (HYSEA 2018)
- Prestigious memberships: NVIDIA Inception, Nasscom DeepTech Club



Team

Management



Dinesh Koka PGDM (IIML) | Anna Univ.
CEO, Co-Founder

- 18+ years in Healthcare | GE, Startups
- Work across Providers, Promoters, Govt
- GE Region Director leading ~\$60M Rev



Vikas Ramachandra Ph.D (UCSD) | BITS Pilani
CTO, Co-Founder

- 14+ years Industry + Research
- 5 Patents | Imaging, Sensors @ Qualcomm
- CV-based Cancer Detection



Dr Lata Kini MD Pathology (KMC)
Chief Medical Officer

- 27+ years in field of Pathology
- Prev: Core Diag, Kidwai Institute, Manipal Hosp
- Expertise across Molecular diag, IHC, advances



Clinical Advisors

Cancer Pathologist



Dr Sundaram
MD (Path), MBBS
Ex-Dean & HOD - NIMS;
Sr Consultant BIACH&RI

R&D, Innovation



Samuel Conway
Innovation, Oxford
Startups

Cancer Surgeon



Dr Sajid Khan
MD, Fellow (Surg Onc)
Yale School of Med

Radiologist, Research



Dr Rammohan VSV
MD (Radiology), MBBS, PhD,
Chief Radiologist, VDC

Thank You