Simplifying the AI consumption process through the implementation of a standard-based AI platform

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AI Trends

- There is an increased number of AI algorithms available to aid in the interpretation of medical images
  - As a consequence, it’s important to standardize and simplify the AI consumption process

Current Architecture

Gets quickly overwhelmed by the increasing number of AI engines connected

- LVO
- Pneumo-thorax
- Bone Fracture
- ICH
- Free Air
- Liver Lesions
- PE
- Pulm Nodule
- Mammo CAD

Images OUT

Results IN

PACS

Diagnostic Reporting

Firewall

GPU Farm

On-premises
A Lesson from Consumer Platforms
They increase efficiency by aggregating distributed data into a single consumption site.
New Architecture

- A standard-based AI platform to deliver a common user experience regardless of the AI solutions adopted
  - Streamline data out of PACS & results into PACS and Reporting System
    - Minimize the impact on Technologists’ workload – no manual pulling & pushing of data
  - Single point of integration with on-premises & cloud-based AI engines
    - Automates the export of cases & intake of results, creates queues based on study priority and improves hardware scalability through load balancing
  - Leverages on industry-wide, vendor-agnostic standards such as DICOM & HL7
  - Greater control can be achieved through a published Open API which is publically available and shared freely
AI Platform Features & Functionality

• Automates the data flows in-and-out of PACS
  – Extraction: Easily select datasets to be routed to external engines
  – Transformation: Anonymize PHI
  – Load: Encrypt for transmission

• Orchestrates the sending of imaging data to the appropriate AI engine
  – No need for the Tech to double-pitch data
  – Provides hardware load balancing
  – Scheduling and Prioritization of cases

• Streamline the display of AI results into the Radiologist workspace, ie, PACS viewer, worklist and/or reporting system
  – Triage cases
  – View CAD results (marks, annotations, measurements, ...)


Radiology IT
Technology Stack w/ AI Platform

- Order Exam
- Register Patient
- Schedule Exam
- Start/Complete Exam

- Messaging
- Worklists
- AI Platform
- PACS

- Specialty Apps
- Diagnostic Reporting

- Results Distribution
- Revenue Cycle
- Analytics

AI Platform
- Display Results Overlays & Scores On Images
- On Worklist: Display AI Processing Status, AI Algorithm Utilized, & Provide Triage based on Findings

PACS
- Move Images X To AI Engine Y

AI RESULTS

Cloud
-肝脏病变
-PE
-ICH
-LVO

GPU Farm
- Mammo CAD
- Pulm Nodule
Integration Profiles

• Integrate AI results directly into PACS viewer
  – GSPS, DICOM SC, DICOM SEG, CAD SR
  – Overlays can be toggle on/off
  – DICOM SC provides minimum level of integration

• Notifications of Results
  – AI processing status
  – AI algorithm utilized
  – Triage assignment based on AI findings
Case Study
AI Platform & AI-based Mammography CAD

- For diagnostic breast exams where the interpretation occurs in near real-time, the AI TAT needs to be < 3 min (illustrated on the right)
- This is critical in order to provide the AI results prior to the radiologist’s start of interpretation
AI Platform Benefits

- Orchestrates the secure exchange of imaging data and intake of AI results in a standardized and simplified manner
- Aggregates the output of multiple AI algorithms under a single platform delivering a consistent end-user experience
- Platform provides AI-vendor independence facilitating the consumption of best-of-breed AI solutions
- Platform automates the data distribution between PACS and AI engines eliminating manual workload by Technologists

Thank you

Questions & Feedback:
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