

ARTIFICIAL INTELLIGENCE IN PREDICTING & PREPARING STAFFING

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AI AT SANFORD


- Enterprise Data and Analytics Department (EDA):
 - 60+ employees dedicated to supplying data and reports at Sanford.
 - Advanced Analytics & Data Science team:
 - Team of 5 providing AI, ML, Automation, and advanced statistical support to the organization
- AI Oversight Committee oversees the approval of *all AI at Sanford and includes members from EDA, Legal, Research, Operations, IRB, Finance, and IT.
- AI Governance Program: Program established to ensure the fair, appropriate, and ethical use of AI at Sanford.



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WHY AI/ML?

TYPES OF INFORMATION WHERE YOU NEED AI




Correctly identifying what is right in front of you

Big data, unbiased, efficient




Dealing with overwhelming complexity

Big data, multiple data sources, measuring the totality of multiple metrics



Being able to see what is around the corner

Tell me what I can't see, predict, prescribe, long range forecast, decision trees



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STAFFING & SCHEDULING

- The Perfect Avenue for AI; Staffing & Scheduling

IS:

- Big Data
- Complex
- Inefficient

NEEDS:

- Forecasting
- Efficiency
- Unbiasedness

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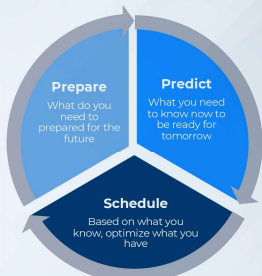
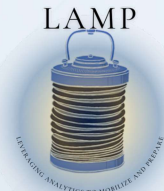
LAMP

Leveraging Analytics to Mobilize & Prepare

Evidence and experience show that having the right number of nurses, with the right skills, in the right place, at the right time **improves** health **outcomes** and the **quality** of care delivered.

In 2019, we recognized that we have an **opportunity** to leverage **predictive** modeling and **analytics** to provide new **insights** into the **future** for nurse staffing and scheduling.


LAMP was developed as an internal solution to help us understand our workforce needs for tomorrow, the next 3 months and even the next 3 years.

Predict: Up-to-date forecasting for short term scheduling & staffing.

Schedule: Scheduling optimization maximizing benefits and efficiency of current and future FTE resources.

Prepare: Short & Long term scenario & simulation analysis of individual departmental FTE needs.





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PREPARE YOUR STAFFING WITH AI

Prepare

- Understanding the needs of your department can be complex.
 - Fluctuating volumes
 - Turnover
 - Vacancy
 - Orientation
 - Training
 - PTO
 -
- Optimize Staffing, while minimizing Cost:
 - Full-Time vs. Part-Time
 - Core vs. Float vs. External
 - Overtime Allotment

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Predict


PREDICT YOUR NEEDS WITH AI

- Knowing how many staff you need doesn't help you if you don't know when.
 - 4 hour-shift increments
 - 7 days/week
 - 12 weeks in a schedule
 - Schedules needed 3 weeks in advance.

630 Forecasted Points (105 days into the future)

- This is supply and demand:
 - Demand = Census (patients)
 - Supply = Staffing





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Schedule

SCHEDULING WITH AI





- Having the right number of staff and knowing when they are needed is 90% of the puzzle.
- Scheduling is the keystone.
 - It is also the most difficult:
 - Preference,
 - Circumstance,
 - Rules, etc.
- For a single department with a common set of rules (staffing ratios, overtime, pto, days on vs. off, etc.):
 - There are over **500 MILLION** decision points you can consider before reaching optimal.



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WHERE CAN AI GO FROM HERE?

- AI in Staffing and Scheduling can expand beyond nursing:
 - Patient Scheduling,
 - Other departments
 - Leveraging AI to better understand the influencers of staffing like:
 - Predicting UPTO/Leave
 - Predicting Turnover
- AI doesn't just predict but also helps you to understand the data.
- AI outside of Staffing & Scheduling:
 - Predicting Patient Diseases,
 - Automation of billing processes,
 - Computer Vision,
 - SOOOOOOOO MUCH MORE.

