

Applied machine learning to optimise clinical management of acute febrile illnesses and neonatal care

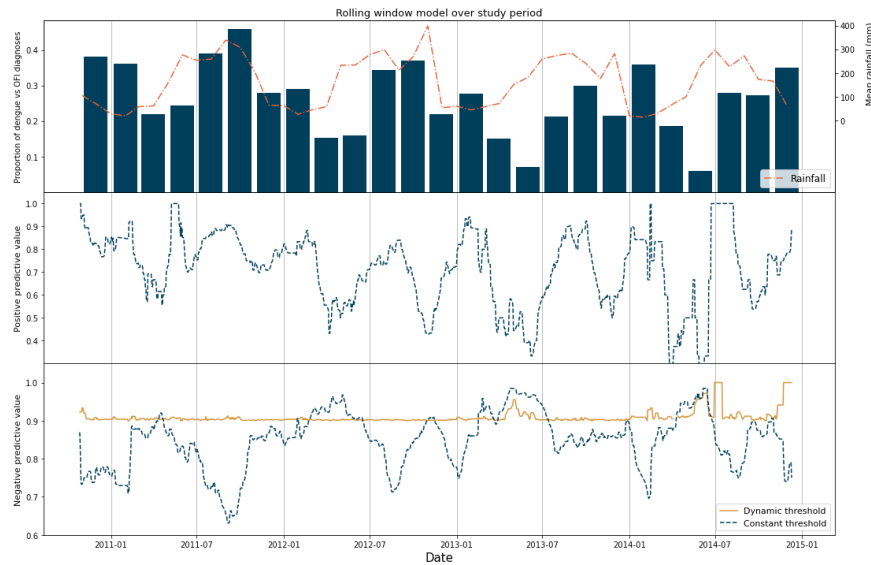
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Acute febrile illnesses

- An inherently dynamic condition
- Evaluation of patient severity and risk is fundamental
- Focus on machine learning approaches which capture change over time

Overview



Predicting acute febrile illness diagnoses using routine laboratory data (Vietnam)

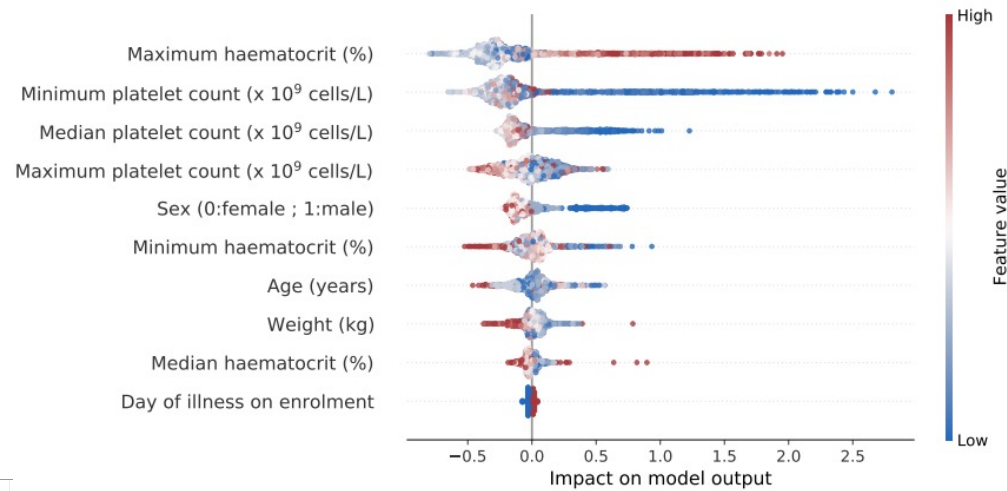
- n=8,100 with acute febrile illness
- incorporation of seasonal factors (rainfall/temperature) increases robustness of model

Summarised periodic

Daily

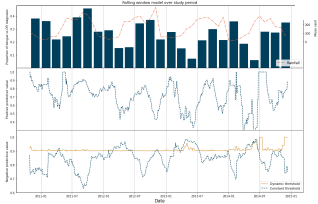
Continuous real-time

Overview



Predicting severity for hospitalised patients with dengue (Vietnam)

- n = 4,131 with confirmed dengue
- full blood count and change over 48 hours of admission excludes severe disease for inpatients

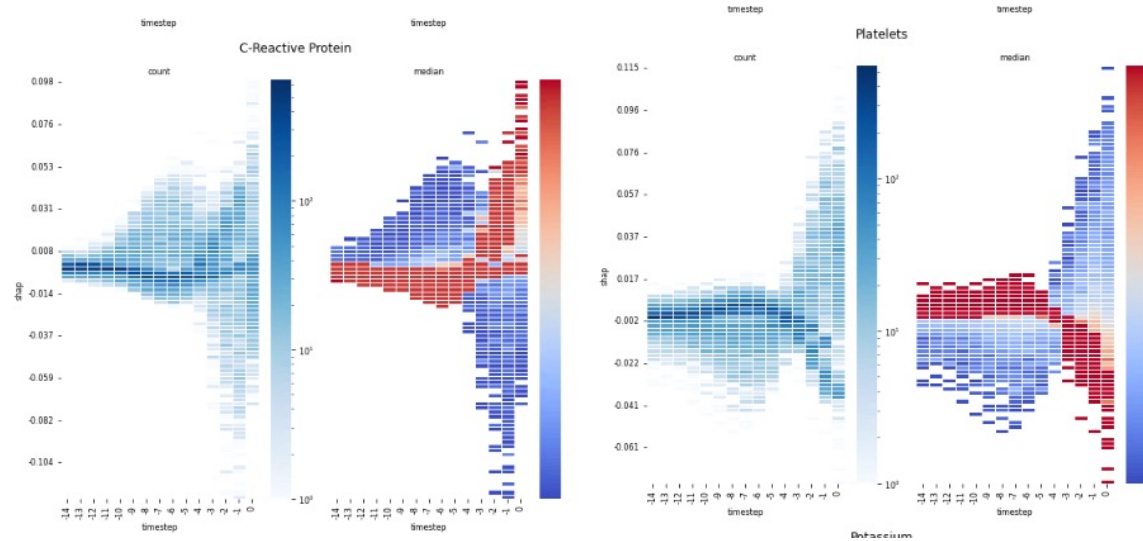


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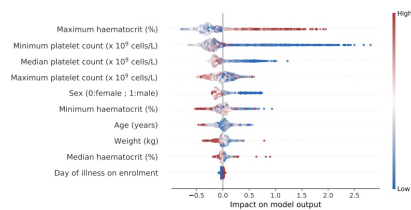
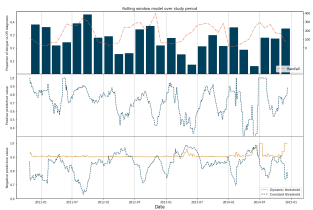
Continuous real-time

Overview



Predicting pathogenic bacterial bloodstream infections (UK) at point of blood culture acquisition

- n=20,850 undergoing blood cultures
- dynamics of routine biomarkers over time are important for predictive performance

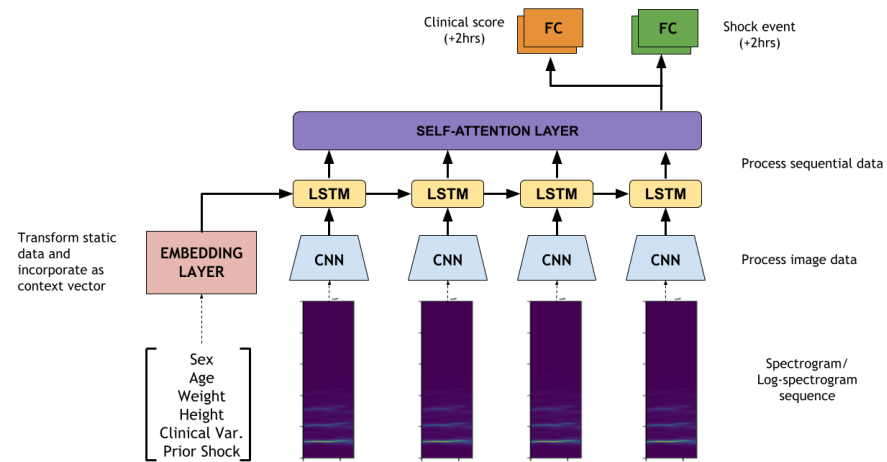


Summarised periodic

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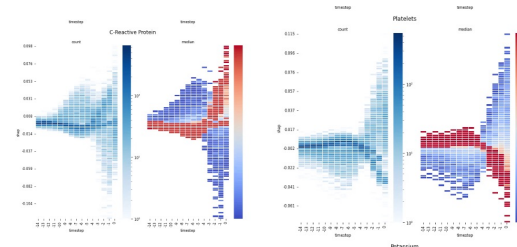
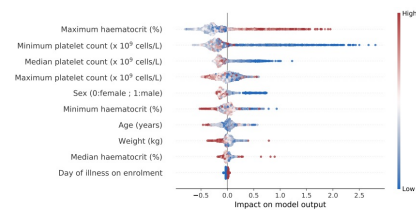
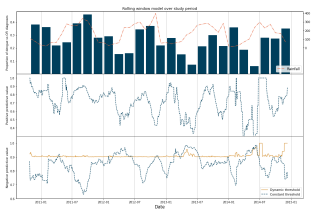
Continuous real-time

Overview



Non-invasive continuous pulse waveform monitoring to risk stratify and predict shock in dengue (Vietnam)

- n=174 patients with dengue monitored for up to 72 hours with a pulse oximeter
- dynamically risk stratify with reference to NEWS2 scoring and shock

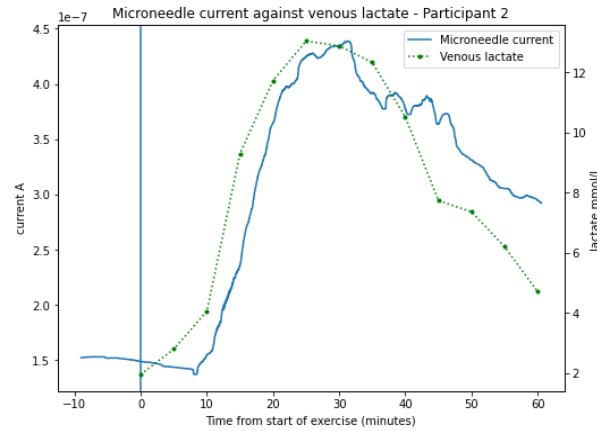
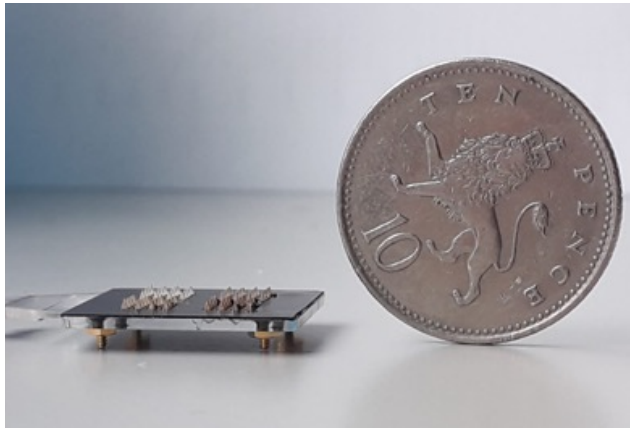


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Daily

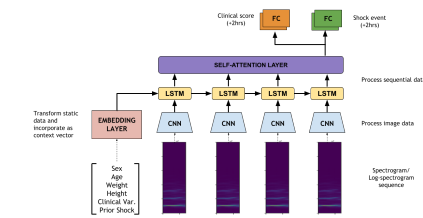
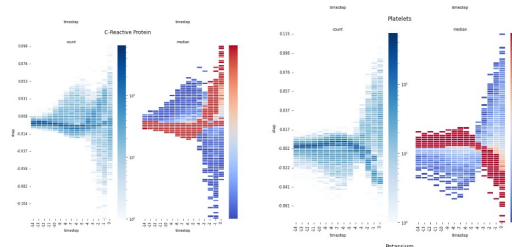
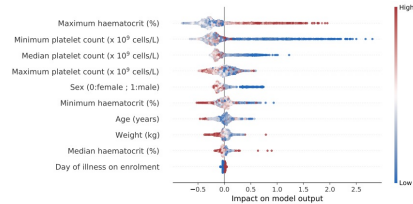
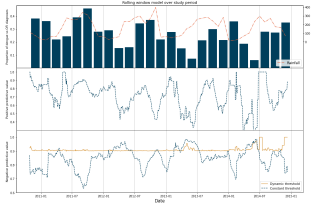
Continuous real-time

Overview



Continuous sensing of interstitial lactate using a minimally-invasive biosensor

- n=10 healthy volunteers exercising to capture lactate dynamics in real-time



Summarised periodic

Daily

Continuous real-time