STUDY PROPOSAL REQUEST FORM

Please complete the form and email to PAROS secretariat at patricia.tay@scri.cris.sg by the stipulated date. You will be notified in due time on whether your study has been accepted for presentation. *Reminder: Please check the list of existing proposals and publications from http://www.scri.edu.sg/crn/pan-asian-resuscitation-outcomes-study-paros-clinical-research-network-crn/paros-publications/ to avoid duplications of proposals. Abstract and manuscript must be sent to PAROS chairs for approval before submission for presentation/publication.*

1. BASIC INFORMATION	
Name: Liu Nan	**Designation:** Associate Professor
Email: liu.nan@duke-nus.edu.sg	**Country:** Singapore

2. TYPE OF REQUEST (Please select one)		
☐ New Study Proposal (initial)	☒ Secondary Analyses	☐ Explanatory Analyses

3. STUDY TITLE

Evaluating variable importance in out-of-hospital cardiac arrest: an interpretable machine learning approach

4. ABSTRACT OF STUDY PROPOSAL

In **no more than 350 words**, describe the study under the given headings below.

Objectives

Understanding the impact of variables on outcomes after out-of-hospital cardiac arrest (OHCA) is important to improving medical interventions and public health policies. Existing empirical evidence is mainly generated from traditional regression analyses of OHCA data (e.g., the PAROS registry), but recent developments in interpretable machine learning (IML) research suggest that findings from such analyses may be biased. This proposal aims to systematically assess the importance of variables to the accurate prediction of OHCA outcomes in Pan-Asian communities using robust IML approaches.

Methodology *(To include sample size, settings, inclusion & exclusion criteria, etc. For secondary & explanatory*

We will conduct retrospective analyses of the PAROS 2 dataset, excluding pediatric victims (aged below 18 years) or OHCA cases without resuscitation. We will include factors in the dataset that have been previously investigated for the relationship with OHCA outcomes and quantify their importance on the prediction of these outcomes using IML methods. One such method is the Shapley variable importance cloud, a recently proposed IML method that accounts for the variability in variable importance for robust statistical inference. We will test the statistical significance of variable importance to provide strong empirical evidence and investigate the interaction among variables in terms of their impact on OHCA outcomes. We will perform stratified analyses by sites to investigate and discuss the differences across communities.

Significance of the study *(e.g. provide brief description on how the study can improve current*

The proposed study will update current understanding of the impact of factors on OHCA outcomes among OHCA victims in Pan-Asian communities. Findings from the study can provide statistical evidence for current perceptions on the (un)importance of factors and identify potential bias in previous assessments, which may resolve the conflicting findings regarding some traditional factors, e.g., gender of OHCA victims. Such robust findings provide data-driven evidence for future improvements in OHCA outcomes across Pan-Asian communities.

GUIDELINES FOR PREPARING NEW PROPOSAL PRESENTATION

If your study proposal has been accepted for presentation, you will be notified by the Secretariat. Please prepare your presentation slides in accordance to the following instructions. Each presenter is given 10 minutes to present (8min presentation + 2min Q&A).

General Instructions
1.   Presentation must include the following sections:
  a.   Introduction
  b.   Objectives/Hypotheses
  c.   Methodology
  d.   Significance

2.   Limit total number of slides to not more than 12. The following are the recommended number of slides for each section.
  a.   Introduction – maximum of 2 slides
  b.   Objectives/Hypotheses – maximum of 2 slides
  c.   Methodology – maximum of 6 slides
  d.   Significance – maximum of 2 slides

3.   Try to use big fonts and contrasting colours to increase readability e.g.
   a.   Black/dark blue font against white background
   b.   White/yellow font against black background
   c.   Black font against blue background

For any enquiries, please contact PAROS secretariat at patricia.tay@scri.cris.sg