BlockRQA: A Novel Tool for Automatic Pattern Detection Across Multivariate and Mixed-Type Time-Series Data

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What you have:
Lots of time series data that characterize different features about a system (e.g., multiple wearable sensors + text records)

What you need:
The ability to detect patterns across the potentially correlated time series (e.g., find complex behavioral patterns that lead to adverse health outcomes, and target them for intervention)

What this project proposes:
A new methodology (rooted in recurrence quantification analysis) for automatically identifying these patterns!

Benefits
• Guaranteed to detect all patterns.
• Works well on small, highly variable data where other methods fail
• Includes the ability to easily cluster “similar but not exact” patterns
• Easy to implement, easy to interpret.

Algorithm Overview
Base-and-Block data transformation

Pattern scoring, clustering and analysis

Results on Novel Clinical Study Data for Type-1 Diabetes Control