Fisher Notes

* "Under the above PDF development, the Fisher Information of  
  Eq. (10) or (11) is interpreted as a measure of the variability in  
  the time the system state spends in the various sections of its  
  steady state trajectory (or, since time and speed are inversely  
  related, variation in the speed of the state over its steady state  
  trajectory)." That first quote is from Mayer et al 2006
* **variation in the speed of the state over its steady state**  
  **trajectory**
* "As stated above, the likelihood of finding the system in one of these combinations depends on the time that the system spends in that state. The time spent in each state depends on the distance traveled through that space and the speed at which it is traveling." The second is Cabezas and Fath 2002
* **The time spent in each state depends on the distance traveled through**  
  **that space and the speed at which it is traveling.**
* "Consider then a dynamic system of dimension n whose steady state trajectory forms a closed loop in state space with period T. Fig. 1 shows the steady state trajectory of a cyclic prey-predator system. We divide the trajectory into a finite number of sub-segments of  
  length Ds. The variable s denotes the position of each sub-segment along the path relative to an unknown initial position, s)."
* The distance part is there if you know what you are looking for

Introduction paragraph topic sentences

1. Regime shifts and quantifying is timely, advancing
2. Quantitative methods for RS work
   1. Detection vs. predicting/forecasting
   2. Model-free vs. model-based methods
3. **Detection vs. prediction**
   1. Examples
   2. Limitations
4. Model free vs. model-based
   1. Examples limitations
5. Fisher Information proposed as a model-free detection method

Notes for Fisher Manuscript v.1.4

1. From Sandefur book (`e.g., A(n+1) = X+a(n)) are called discrete dynamical systems or difference equations.

R. A. Fisher is one of the most prominent figures in the development and current use of statistics and experimental design. It is only fitting to highlight some of his many contributions to statistical theory and practice. Among his discoveries are significance testing(Bandyopadhyay and Cherry 2011), maximum likelihood estimation (MLE), permutation (re-sampling) distributions and key components of experimental design including randomization, replication, blocking, confounding, and the analysis of variance (ANOVA).

Fisher first defined what is now called Fisher Information (FI) as, a ‘measure of indeterminacy’ (Fisher 1922). FI describes the amount of information that is available around an estimated parameter on which the observed quantities depend, from a set of noisy data(Kibble 1999). FI is the inverse of the variance of a parameter estimate for many common distributions (e.g., Gaussian, Poisson; citation) and is commonly used to calculate the covariance matrix associated with the likelihood, p(y|Î¸).