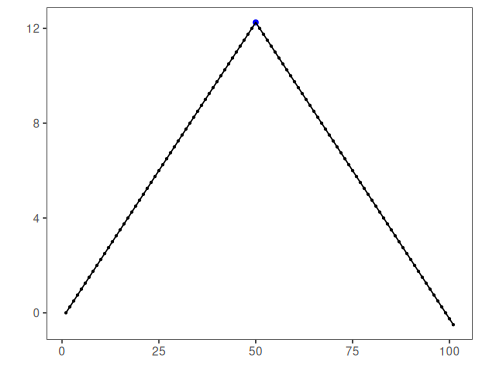
Overview and objectives: This notebook illustrates typical change-point scenarios (single break, multiple breaks, variance/volatility shifts) and how Harbinger visualizes detected change locations. We use the unified pipeline to fit, detect, and plot across datasets, highlighting when classic (AMOC/BinSeg/PELT) or regression-based (GFT/Chow) approaches are appropriate.

# Install Harbinger (if needed)  
#install.packages("harbinger")

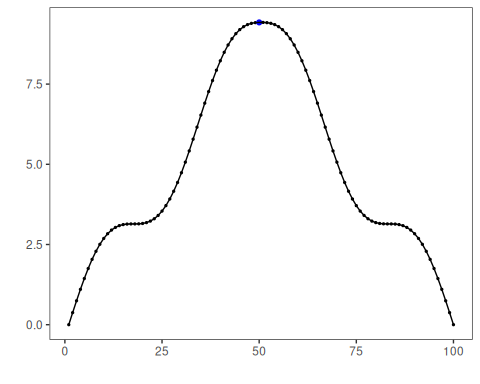
# Load required packages  
library(daltoolbox)  
library(harbinger)

# Load change-point example datasets and create a base object  
data(examples\_changepoints)  
model <- harbinger()

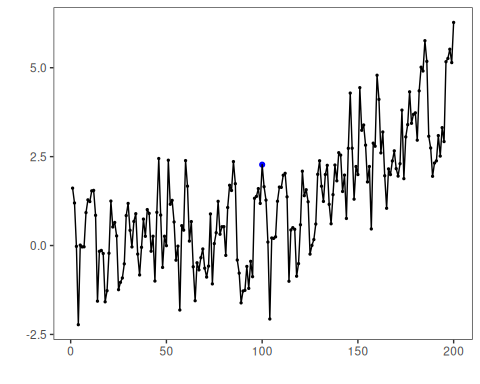
# Simple change point  
dataset <- examples\_changepoints$simple  
model <- fit(model, dataset$serie)  
detection <- detect(model, dataset$serie)  
har\_plot(model, dataset$serie, detection, dataset$event)



# Sinusoidal pattern with regime shift  
dataset <- examples\_changepoints$sinusoidal  
model <- fit(model, dataset$serie)  
detection <- detect(model, dataset$serie)  
har\_plot(model, dataset$serie, detection, dataset$event)

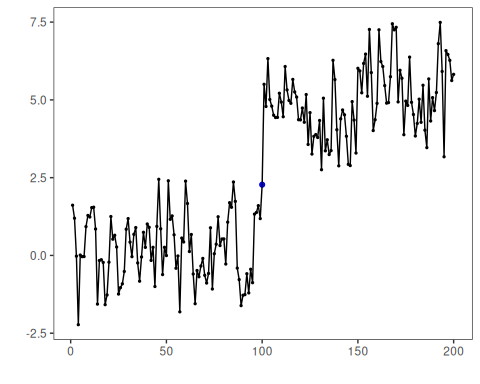


# Incremental trend changes  
dataset <- examples\_changepoints$incremental  
model <- fit(model, dataset$serie)  
detection <- detect(model, dataset$serie)  
har\_plot(model, dataset$serie, detection, dataset$event)



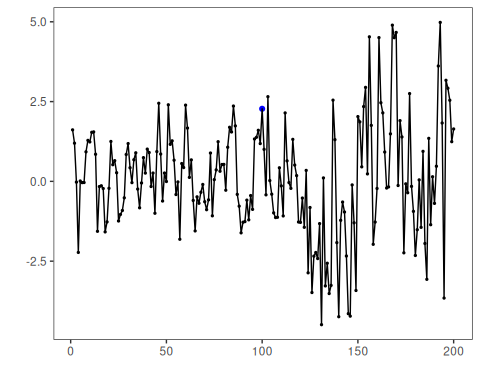
# Abrupt level shift  
dataset <- examples\_changepoints$abrupt  
model <- fit(model, dataset$serie)  
detection <- detect(model, dataset$serie)  
har\_plot(model, dataset$serie, detection, dataset$event)

## Don't know how to automatically pick scale for object of type <ts>. Defaulting to continuous.

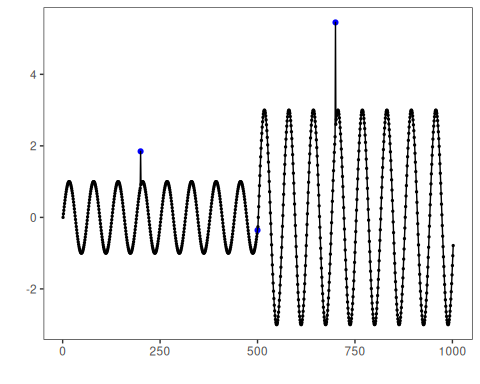


# Volatility (variance) change  
dataset <- examples\_changepoints$volatility  
model <- fit(model, dataset$serie)  
detection <- detect(model, dataset$serie)  
har\_plot(model, dataset$serie, detection, dataset$event)

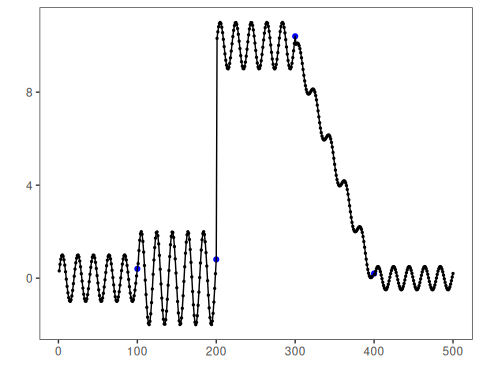
## Don't know how to automatically pick scale for object of type <ts>. Defaulting to continuous.



# Increasing amplitude  
dataset <- examples\_changepoints$increasing\_amplitude  
model <- fit(model, dataset$serie)  
detection <- detect(model, dataset$serie)  
har\_plot(model, dataset$serie, detection, dataset$event)



# Complex multi-regime series  
dataset <- examples\_changepoints$complex  
model <- fit(model, dataset$serie)  
detection <- detect(model, dataset$serie)  
har\_plot(model, dataset$serie, detection, dataset$event)



References

* Hinkley, D. V. (1970). Inference about the change-point in a sequence of random variables. Biometrika, 57(1), 1–17.
* Killick, R., Fearnhead, P., Eckley, I. A. (2012). Optimal detection of changepoints with a linear computational cost. JASA, 107(500), 1590–1598.
* Zeileis, A., Leisch, F., Kleiber, C., Hornik, K. (2002). strucchange: An R package for testing for structural change in linear regression models. JSS, 7(2). <doi:10.18637/jss.v007.i02>