

- :

jam\_orak@yahoo.com :

:

-

:

:

:

:

:

:

// :

// :

:

:

:

(Mixed distributions)

(Hidden Markov Models)

(Bayesian approach)

/

:

/

(Goodness of fit)

:

:

:

đ

(Cough 2005)

)

(

(Perlin 2006)

đ

:

Classical or frequentist

( Painter 2003)

)

( Seasonality

Cyclic Regression

:

$$\mu(t) = \beta_0 + \beta_1 t + \beta_2 \cos\left(\frac{2\pi t}{a}\right) + \beta_3 \sin\left(\frac{2\pi t}{a}\right)$$

Linear trend

$S_t$   
 $Y_t$

$S_t$

(Bilmes 2002)

$Y_t$

$\{S_t\}$

(Painter 2003)

)

(

$\{Y_t\}$

(Tan Say 2001)

$Y_t$

$\{S_t\}$

:

$\{Y_t\}$

$\{S_t\}$

$\{S_t\}$

States sequence

$\{S_t\}$

Centers for Disease Control (CDC)

Observed sequence

$\{Y_t\}$

$( )^{\delta}$

$\{Y_t\} \{S_t\}$

.

:

(

(

(

$S_t$

$Y_t$

$\{S_t\}$

%

$\{Y_t\}$

.(CDC 2006)

:

.(WHO 2004)

.( $\pi_1$ )

Winbugs

<http://www.mrc-bus-cam.ac.uk/bugs>.

.( )

:

( )

.

/

$$\beta_2 \quad \beta_1 \quad \beta_0$$

$$10^{-6}$$

$\beta_3$

)

(

/

/

Winbugs

$$\mu(t) = 3.08 - 0.01t - 1.46 \cos\left(\frac{\pi t}{6}\right) + 0.65 \sin\left(\frac{\pi t}{6}\right)$$

$$\mu(t) = 7.91 - 0.07t - 3.38 \cos\left(\frac{\pi t}{6}\right) + 1.59 \sin\left(\frac{\pi t}{6}\right)$$

( )

( )  
( )

/

/

/

/

(% / )

/

:

)

(

( / )

"

"

:

-

---

B	B	B	B	
/	/	/	/	
/	/	/	/	
/	/	/	/	
/	/	/	/	%
/	/	/	/	
/	/	/	/	
/	/	/	/	
/	/	/	/	%

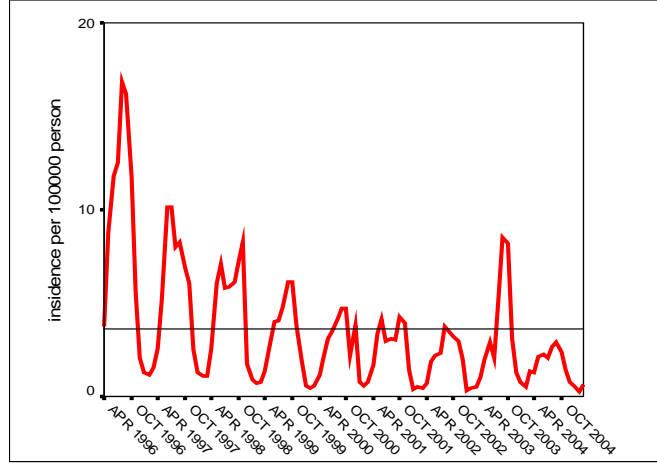
---

-

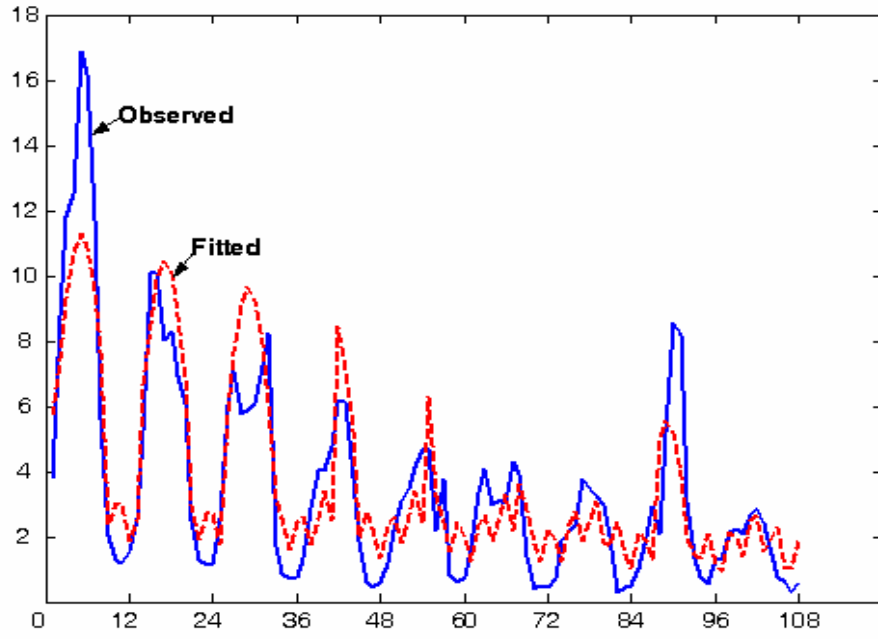
---

/	/	/	
/	/	/	
/	/	/	
/	/	/	%

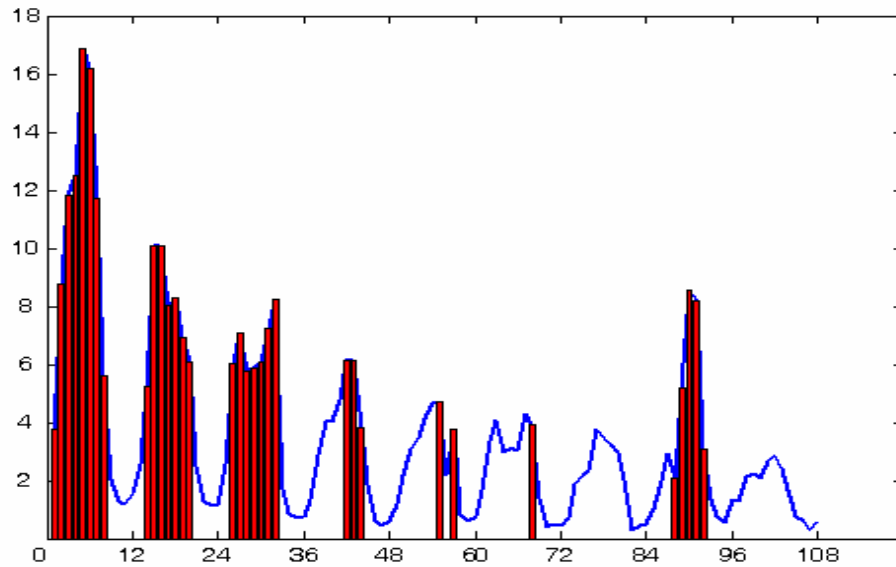
---



( - )







## References:

- Bilmes, J., 2002. What HMMs can do. [online]. Available from: <http://www.bilmes@ee.washington.edu> [cited 22 November 2005].
- Chulani, S., Boehm, B. and Steece, B., 1998. *Calibrating Software Cost Models Using Bayesian Analysis*. USC-CSE.
- Cough Rober, B., 2005. Introduction to Infectious disease, [on line]. Available from: <http://www.bs.utmb.edu/> [cited 15 November 2005].
- Centers for Disease Control and Prevention, 2006. The Impact of Malaria, Leading Cause of Death Worldwide. [on line] Available from: <http://www.cdc.gov.malaria/fag.htm> [cited 21 June 2006].
- Painter, J., 2003. *Uses of Bayesian Statistics*. [on line]., Tessella **1**(1), Available from: <http://www.tessella.com/Literature/Supplements/PDF/BayesianStatistics.pdf> [cited 25 June 2006].
- Perlin, D., 2006. *The Global Challenge of Infectious Disease*. *Frontiers of Biomedical Sciences*. New York Academy of Sciences.
- Tan Say, B., 2001. *Introduction to Bayesian Methods for Medical Research*. Annals Academy of Medicine Singapore.
- World Health Organization Geneva, 2004. Using Climate to Predict Infectious Disease Outbreak: a review. Communicable Disease Surveillance and Response/ Protection of the Human Environment Roll Back Malaria.