MATEMATISKA INSTITUTIONEN
STOCKHOLMS UNIVERSITET
Avd. Matematik

SJÄLVSTÄNDIGT ARBETE I MATEMATIK

Måndagen den 3 februari kl. 13.00–14.00 presenterar Kajsa Modin sitt arbete "Robustness in bacterial chemotaxis" (15 högskolepoäng, grundnivå).

Handledare: Yishao Zhou

Plats: Sal 33, hus 5, Kräftriket

Sammanfattning: Applying mathematics on biological system is an emerging science and the main goal is to model and discover emergent properties. Within this science the aim is to examine interactions within a given biological system, to understand the behaviour and functions for these interactions that the system exhibits. Biological systems are complex chemical networks that often operate under a variety of external stimuli, therefore it is of interest to analyse the robustness of these systems to know how and why they are able to function in different environments. In this thesis, the focus lies on understanding the robustness of the biological system bacterial chemotaxis. The basis for the mathematical approach is control theory and it is used to trying to characterise the mechanism robustness that the bacterial chemotaxis exhibits. The robustness analysis was done by studying the stability of the bacterial chemotaxis, using several stability criteria. In addition the robustness was analysed by examining the mechanism adaptation that the bacterial chemotaxis exhibits. Adaptation is analysed by plotting the steady state that the bacterial chemotaxis presents and by a control theory technique called integral feedback. Thus, by using different techniques from control theory, it was possible to display that the bacterial chemotaxis is a robust mechanism.

Alla intresserade är välkomna!