

# Predict

## About the program:

The response of a system is analysed for an arbitrary input signal. The response in a future horizon is partly the result of past input effects preceding the actual time point  $k$  (free response), and partly the result of actual and future control increments (forced response). The JAVA applet demonstrates that the output is the sum of the free and the forced responses in the case of a first order system. The past input is fixed. The user can change the actual and future control increments and can check how the future output is composed of the sum of the free and forced responses.

Pre-calculated input increments ensuring a constant desired output signal also can be set to analyse the control performance of predictive control with different weighting factors in the cost function.

## How to use the program:

- Pressing the „Results” button opens a new window with the actual results in text form.
- Press the „ $Y = V \cdot dU + Y_p$ ” button to draw image.
- In the choicebox under the button there are some preset parameters.  
The  $dU$  values can be manually set by the textfields under it.  
With the given  $dU$  parameters the cost function  $J$  is minimized to reach the predicted constant reference signal.  $\gamma = \lambda_{uj}$  and  $\lambda_{yne} = 1$  is supposed.