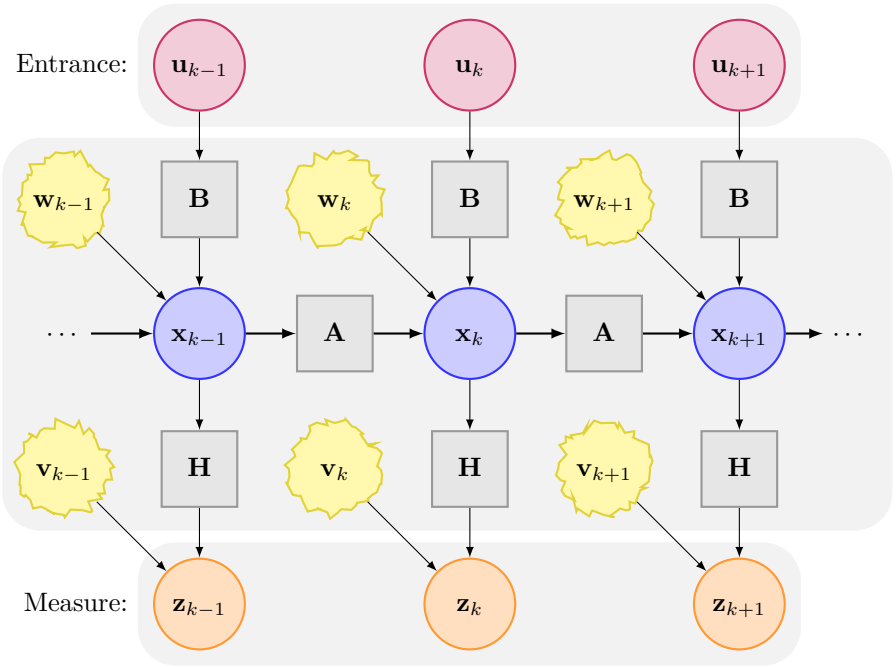

Figure 1: Kalman filter system model

This is the system model of the (linear) Kalman filter. At each time step the state vector $\mathbf{x}_k$ is propagated to the new state estimation $\mathbf{x}_{k+1}$ by multiplication with the constant state transition matrix $\mathbf{A}$. The state vector $\mathbf{x}_{k+1}$ is additionally influenced by the control input vector $\mathbf{u}_{k+1}$ multiplied by the input matrix $\mathbf{B}$, and the system noise vector $\mathbf{w}_{k+1}$. The system state cannot be measured directly. The measurement vector $\mathbf{z}_k$ consists of the information contained within the state vector $\mathbf{x}_k$ multiplied by the measurement matrix $\mathbf{H}$, and the additional measurement noise $\mathbf{v}_k$.