A choice of gain K or pre-compensator C, based on knowledge of the plant G, will only be as good as our knowledge of G is. If a choice proves unsatisfactory, one can change it in a data-driven manner (i.e. depending on input/output data). Thus we introduce an extra feedback loop, the update loop for parameters of the controller. We call a system with such an extra loop an adaptive control system. The rule for updating C or K is called the adaptation rule. Finding adaptation rules which achieve effective performance under plant uncertainty / variation is the subject of this course.

It is clear that one can speak of adaptive control of nonlinear systems as well.