Tutorial on Bibliography

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1 Aryabatta's Identity for Control Design

Polynomial equations of the form

$$X(z) + D(z) + Y(z)N(z) = C(z)$$

arise frequently in control system design. In the above equation, $D(z)$, $N(z)$ and $C(z)$ are known polynomials and $X(z)$ and $Y(z)$ are unknowns, to be determined. This equation is known as Diophatine equation (Kucera 1979, Kailath 1980) and Aryabatta's identity (Vidyasagar 1985). A solution technique to this identity is presented in (Chang and Pearson 1982). Matlab and Scilab implementations of this solution are available on the web (Moudgalya 2007a).

The textbook by Moudgalya (2007b) illustrates several control design examples using Aryabhatta's identity. The approach followed in this book is explained in (Moudgalya and Shah 2004, Moudgalya 21–23 June 2006). In addition to handling control design problems in conventional domains, this approach will be useful also for naturally discrete time problems that arise in computing systems, see for example, (Majumdar *et al.* 2003, Majumdar *et al.* 2004, Venkateswaran and Son 2007).

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