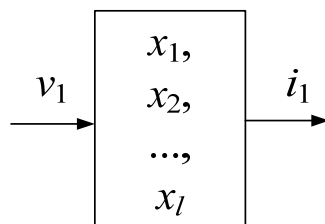




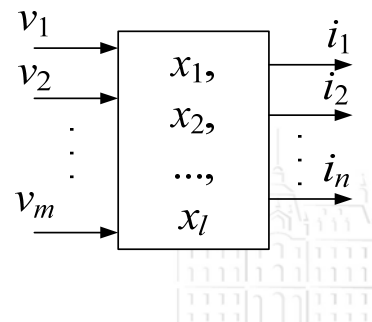
Multivariabilni sistemi, z-transform

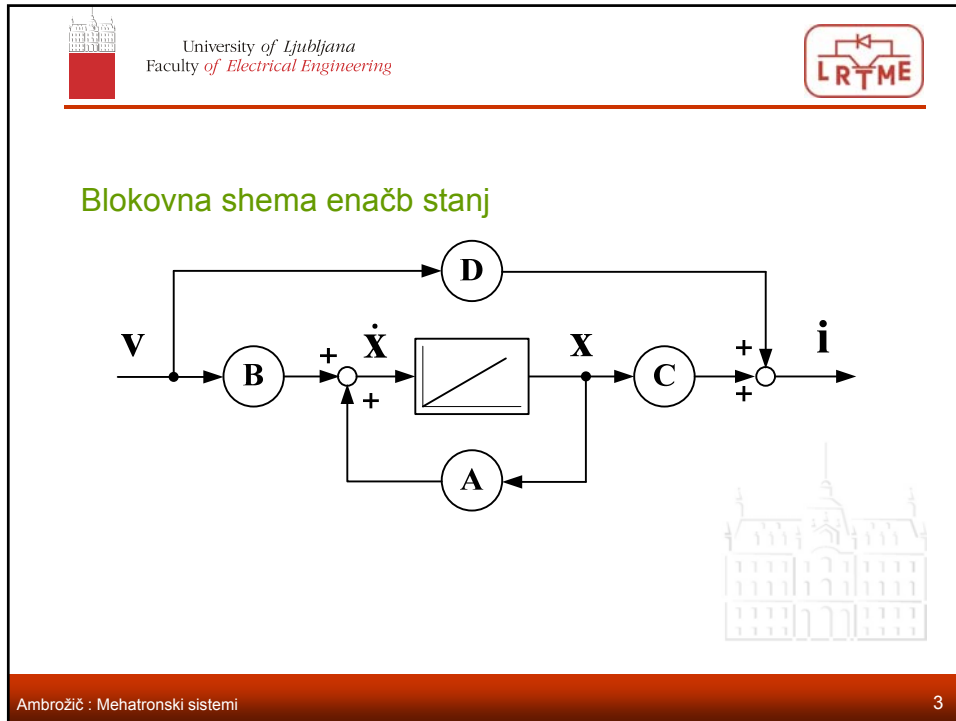


Enovariabilni sistem - SISO



Multivariabilni sistem - MIMO





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Enačbe stanj (ang. state equations) za **linearni** sistem

$$\dot{\mathbf{x}}(t) = \mathbf{A}\mathbf{x}(t) + \mathbf{B}\mathbf{v}(t)$$

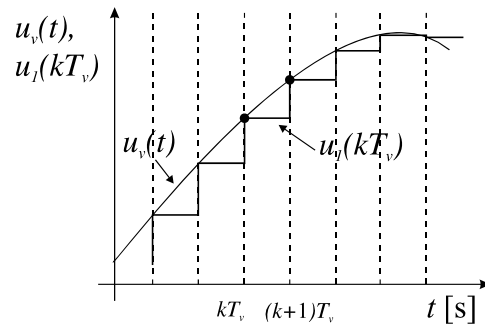
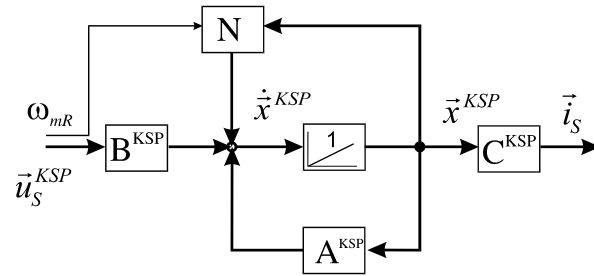
$$\mathbf{i}(t) = \mathbf{C}\mathbf{x}(t) + \mathbf{D}\mathbf{v}(t)$$

$$\mathbf{v} = \begin{bmatrix} v_1 \\ v_2 \\ \vdots \\ v_m \end{bmatrix}, \quad \mathbf{i} = \begin{bmatrix} i_1 \\ i_2 \\ \vdots \\ i_n \end{bmatrix}, \quad \mathbf{x} = \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_l \end{bmatrix}$$

Ambrožič : Mehatronski sistemi 4



Primer **nelinearnega** sistema

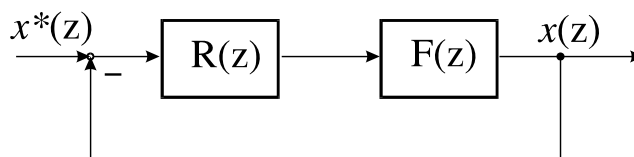


Diskretizacija zvezne funkcije





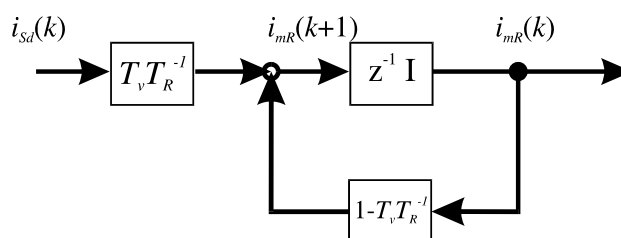
„Dead-beat“ regulacija



Popolnoma diskretni regulacijski sistem

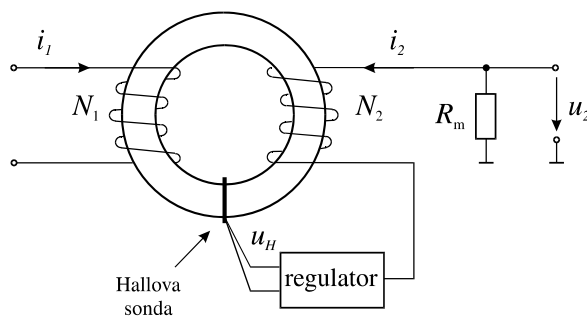


Blokovna shema diskretnega člena prvega reda



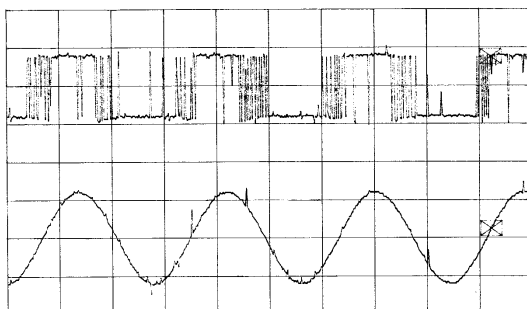


Senzorika v električnih pogonih

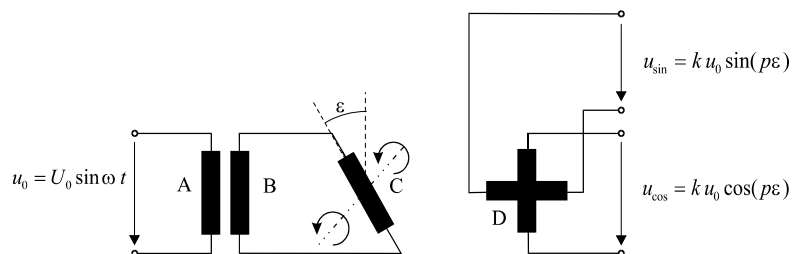


Princip delovanja tokovnega merilnika s Hallovim senzorjem (sondo)






Napetost pretvornika pred in po filtriranju (x-os: 5 ms/delec, y-os: 5 V/delec)




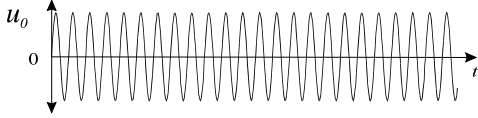
Principielna zgradba resolverja (p je število polovih parov resolverja)



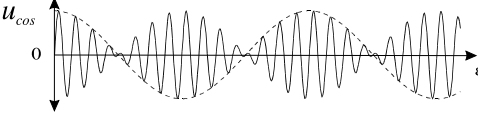


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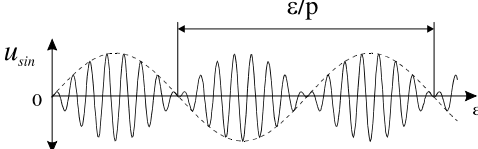




u_o




u_{cos}




u_{sin}


Oblike napetosti v resolverju



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A




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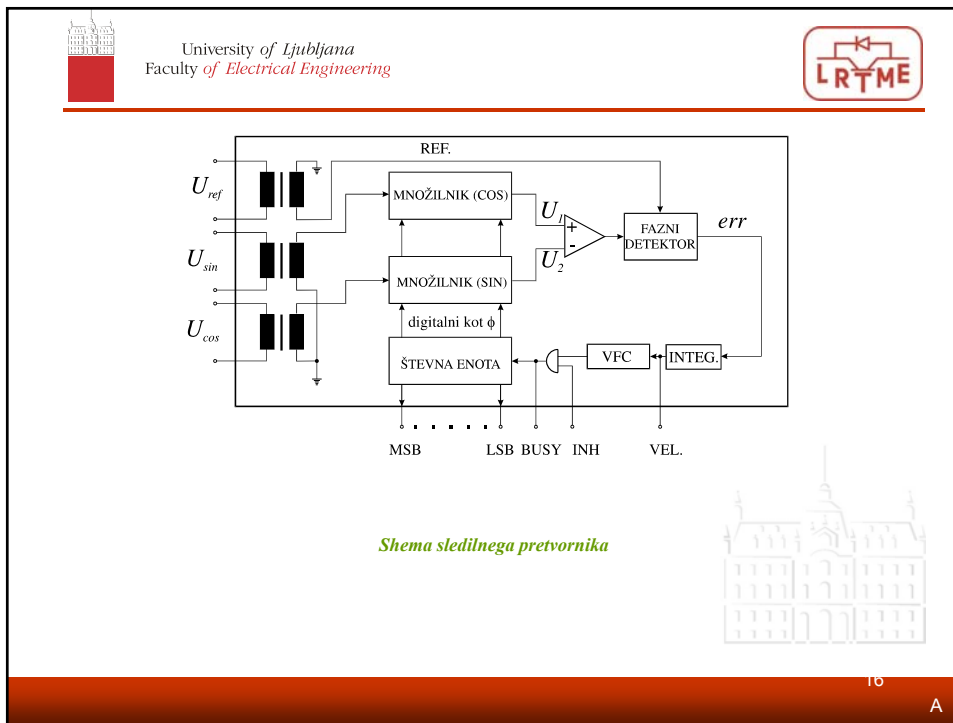
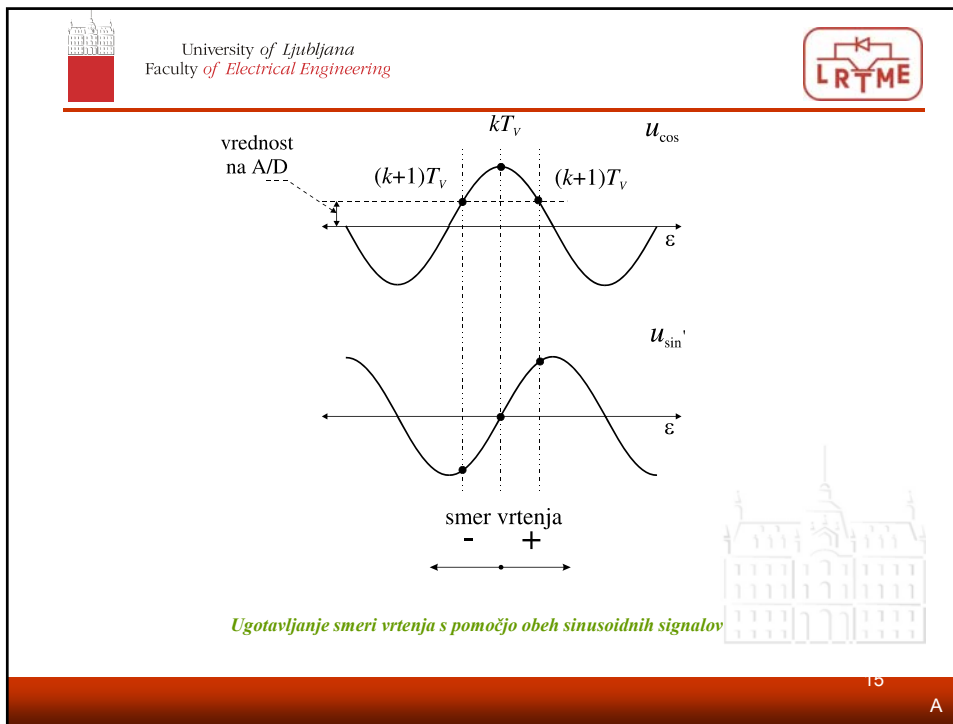
μP


- $\arctg(u'_{sin}/u'_{cos})$
- korektura kvadranta

Princip izračuna kota zasuka iz sinusnega in kosinusnega signala




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A

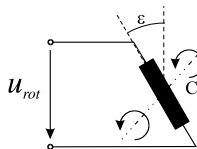




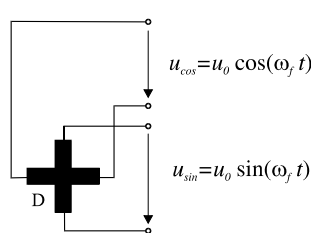
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rotor




stator




Inačica resolverja z dvema statorskima in enim rotorskim navitjem

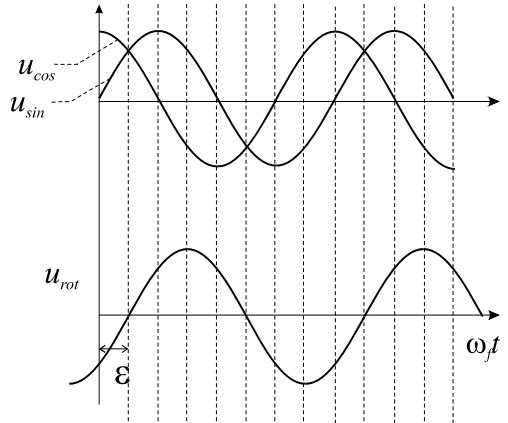


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Oblike napetosti pri resolverju z dvema statorskima in enim rotorskim navitjem



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Zgradba enkoderja


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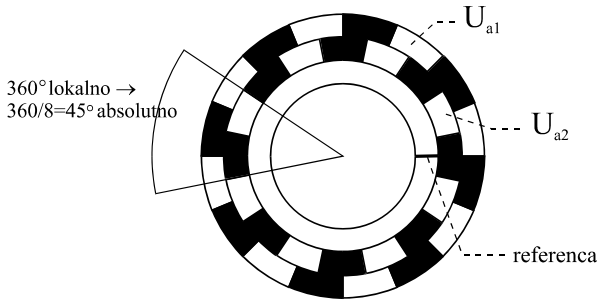
Porazdelitev področij v absolutnem dajalniku pozicije (MSB-najbolj pomemben bit, LSB-najmanj pomemben bit)

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360° lokalno →
360/8=45° absolutno


U_{a1}
 U_{a2}
referenca

Porazdelitev področij v inkrementalnem dajalniku pozicije s pravokotnimi signali




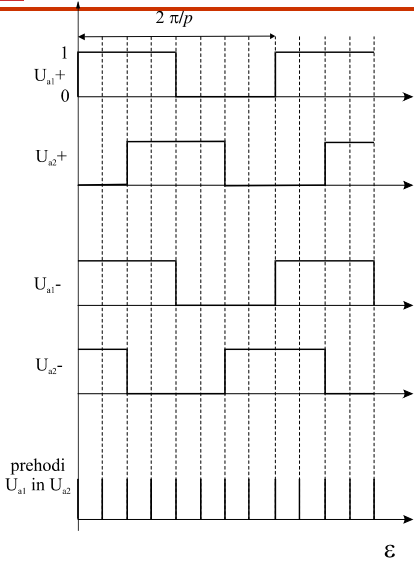
Z1

A



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$2\pi/p$

U_{a1+}
 U_{a2+}
 U_{a1-}
 U_{a2-}
prehodi
 U_{a1} in U_{a2}


ϵ

Oblike pravokotnih signalov iz inkrementalnega dajalnika z ozirom na smer vrtenja (+ ali -)




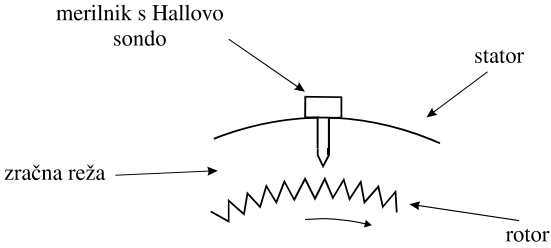
Z2

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Princip delovanja induktivnega dajalnika s sinusnimi signali



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Ambrožič : Mehatronski sistemi
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