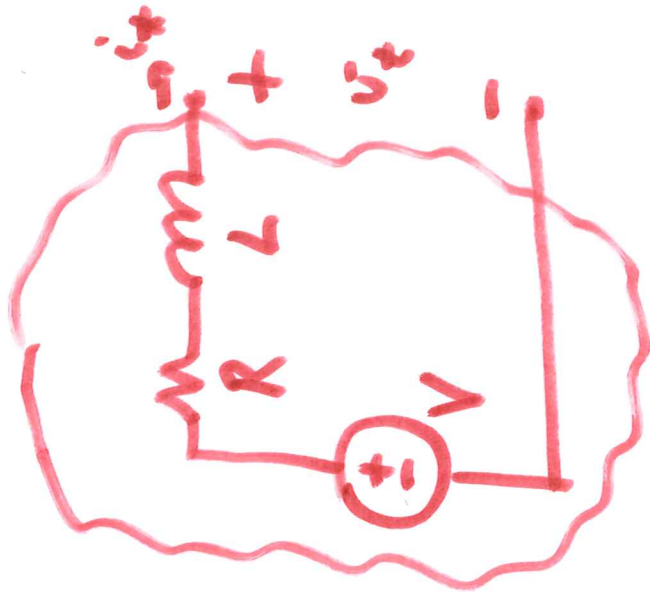


ECE 404-TD / 504-TD

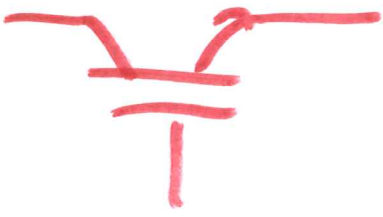
ST: T&D APPLICATIONS OF  
VOLTAGE SOURCE CONVERTERS

SESSION no. 26

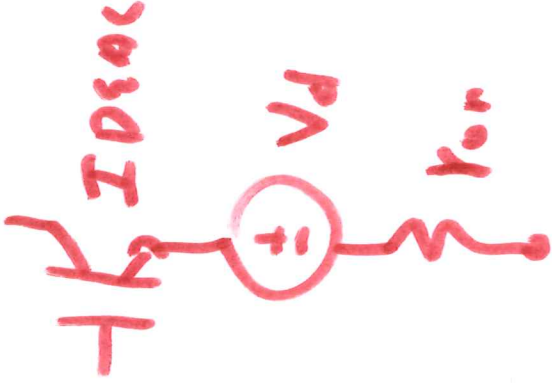


BIG, LINEAR,  
COMPLICATED  
CIRCUIT!

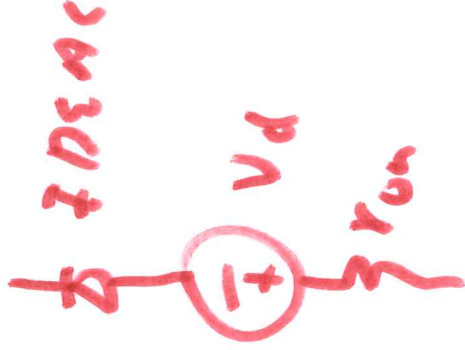
TERMINAL  
BEHAVIOR  
MODEL



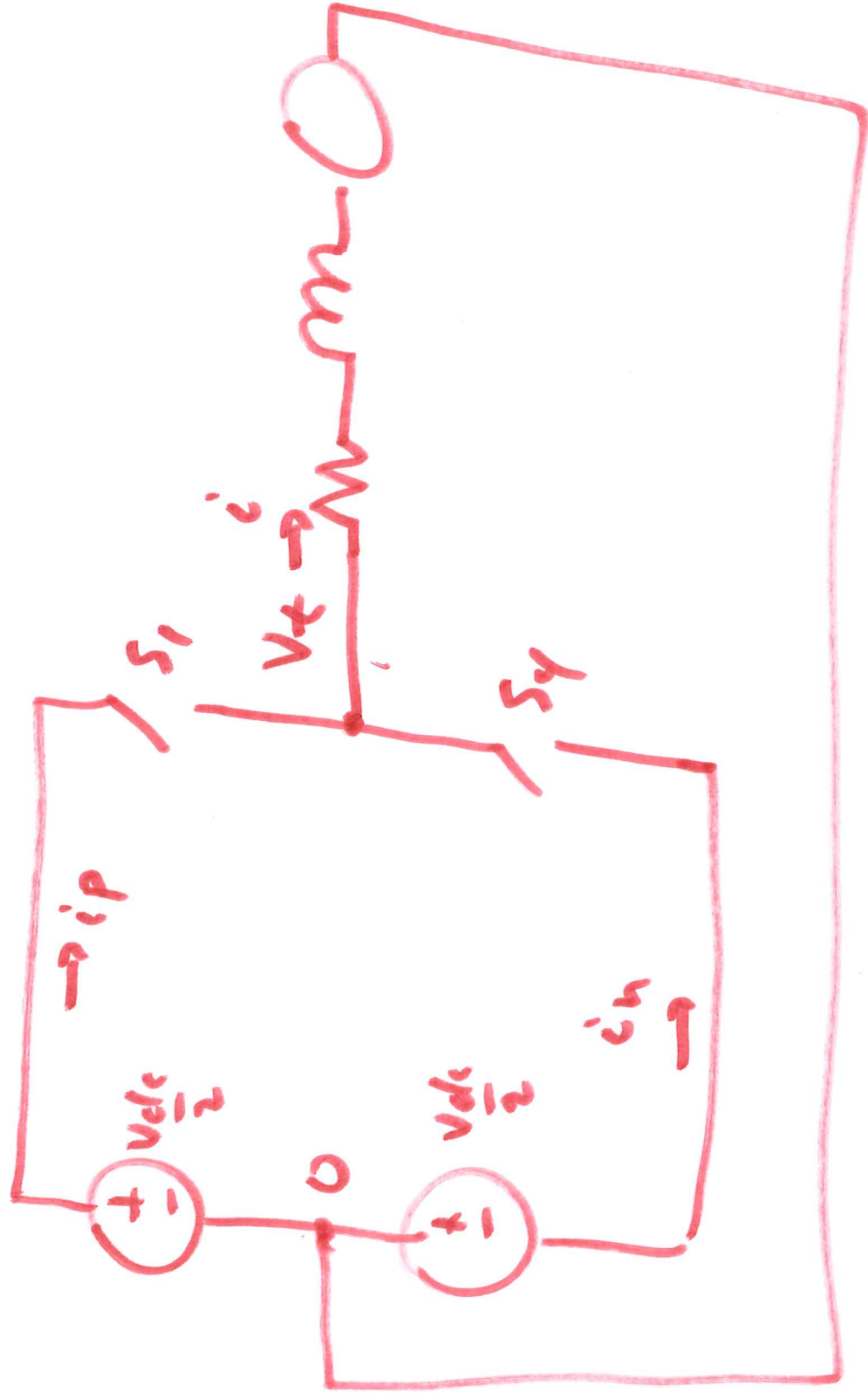
=



=



# Switched mode /



$$s_1 + s_4 = 1 \quad s_1(x), s_4(x)$$

$$v_4(x) = \frac{v_{dc}}{2} (s_1(x) - s_4(x))$$

$$i_p(x) = s_1(x) i_c$$

$$i_n(x) = s_4(x) i_c$$

$$P_{dc} = P_4 = v_4 i_c = \frac{v_{dc}}{2} (s_1 - s_4) i_c$$

ECE 404 / 504

T & D Applications of Voltage Sourced Converters

Lesson 27

Converter modeling introduction

1. Modeling is engineering at its basic level. After all, engineering is the art of determining what to safely ignore. Our models are just this: simplified versions of reality that express, for good or ill, what we want to do. We lack the resources to include everything, even if we could.
2. Our control system is NEVER any better than our model. Our understanding determines what we can do.
3. Don't let your computation power do your thinking for you! Think before doing your computer work. Think while doing your computer work. Think after doing your computer work.
4. Take one bite at a time. If you are building a model, make sure each submodel, however tiny, works well before going on to the next one or an interface. Interfacing submodels will take more time and effort than the sum of creating the submodels.

Thevenin: This is where all that sweating over circuit analysis and cursing Thevenin will finally pay off.

Switching function

$s(t)=1$  conducting;  $0$  blocking;