

**PEMBUATAN DC-DC CONVERTER TIPE BOOST DENGAN  
MENGUNAKAN TEKNIK KENDALI VIRTUAL RESISTANCE**

**Tugas Akhir**

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Sarjana  
Teknik Elektro



oleh

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UNIVERSITAS PENDIDIKAN INDONESIA  
2019**

# **PEMBUATAN DC-DC CONVERTER TIPE BOOST DENGAN MENGGUNAKAN TEKNIK KENDALI VIRTUAL RESISTANCE**

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Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Sarjana Teknik  
pada Fakultas Pendidikan Teknologi dan Kejuruan

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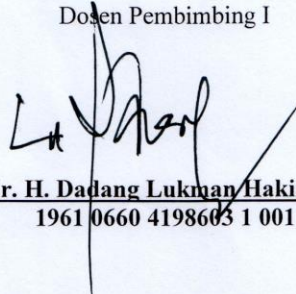
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**Pembuatan DC-DC Converter Tipe Boost dengan Menggunakan Teknik Kendali  
Virtual Resistance**

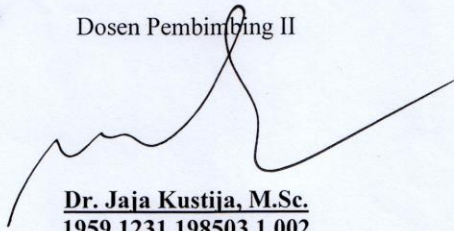
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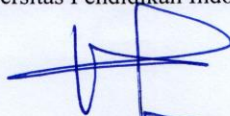
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## ABSTRAK

Boost konverter merupakan salah satu alat yang digunakan untuk mengubah level tegangan dari level tegangan yang rendah menuju level tegangan yang lebih tinggi. Objek penelitian ini adalah konverter DC-DC Boost topologi konvensional dengan menitik beratkan pada kendalinya guna memperbaiki respon nilai tegangan keluaran terhadap gangguan. Kendali yang akan digunakan pada penelitian ini adalah kendali jenis *virtual resistance* dimana dengan adanya kendali ini nantinya rangkaian seolah-olah akan memiliki karakteristik seperti saat memiliki resistansi secara real pada sisi masukan dan keluaran. Dimulai dari perancangan rangkaian power, sensor, dan simulasi menggunakan beberapa *software* PSIM, nantinya kendali tersebut akan diimplementasikan dengan Arduino sebagai mikrokontroler utama. Proses pengujian berupa pengujian *open loop* dan pengujian dengan memvariasikan nilai salah satu resistansi dengan resistansi lainnya dibuat konstan. Hasil penelitian ini berupa boost konverter yang dapat menaikkan tegangan yang sesuai dengan perancangan yaitu sebesar 50 volt.

Kata kunci: *Converter DC-DC, Boost, Virtual Resistance, Arduino, PSIM,*

## ABSTRACT

*Boost converter is one of the tools used to change the voltage level from a low voltage level to a higher voltage level. The object of this study is a conventional topology DC-DC converter with emphasis on its control to improve the response of the output voltage value to interference. The control that will be used in this study is the type of control virtual resistance where with this control the circuit will as if it will have characteristics such as having real resistance on the input and output sides. Starting from designing power circuits, sensors, and simulations using several software PSIM, later the control will be implemented with Arduino as the main microcontroller. The testing process is in the form of open loop testing and testing by varying the value of one resistance with the other resistance being made constant. The results of this study are boost converters which can increase the voltage according to the design of 50 volts.*

**Keywords:** *converter DC-DC, Boost, Virtual Resistance, Arduino, PSIM,*

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