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Maximizing Power Transfer for Dynamic Wireless Charging Electric Vehicles

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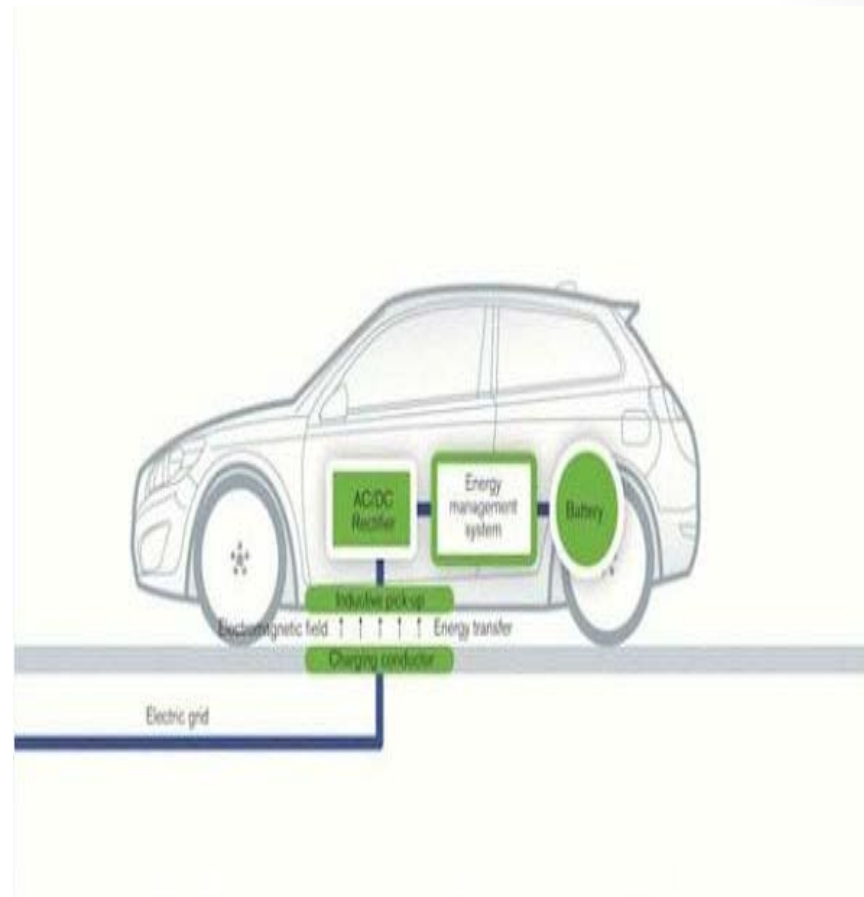
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Dynamic Charging of Electric Vehicle



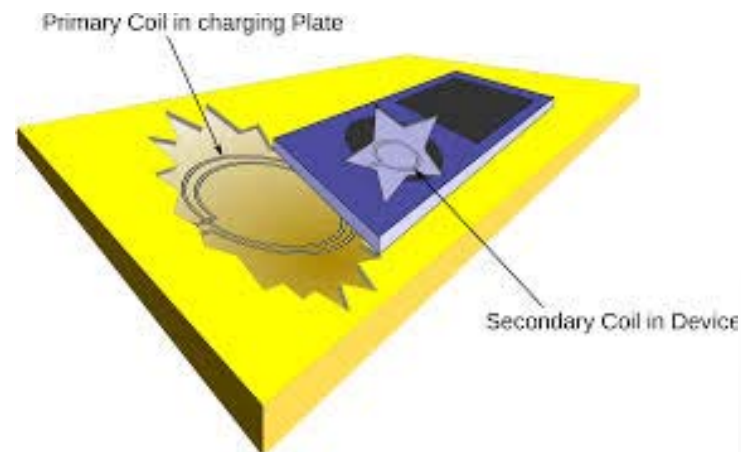
Today



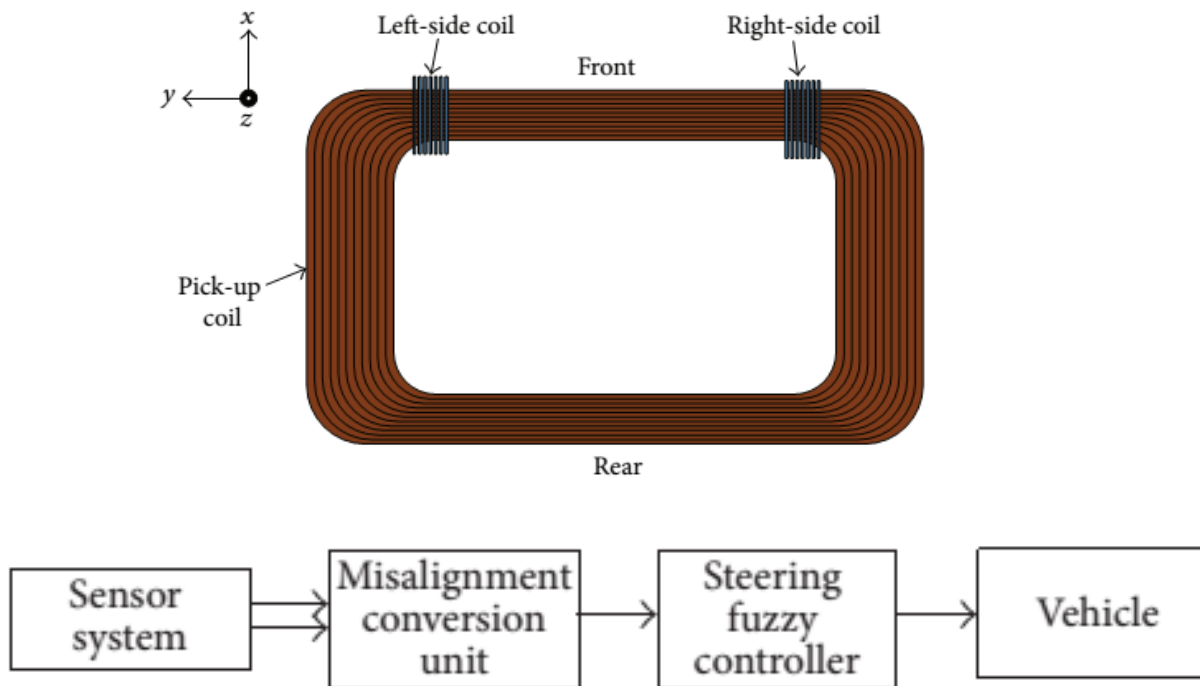
Tomorrow

Coil Alignment for energy transfer efficiency

Coil alignment is needed to increase energy transfer efficiency for dynamic charging vehicle



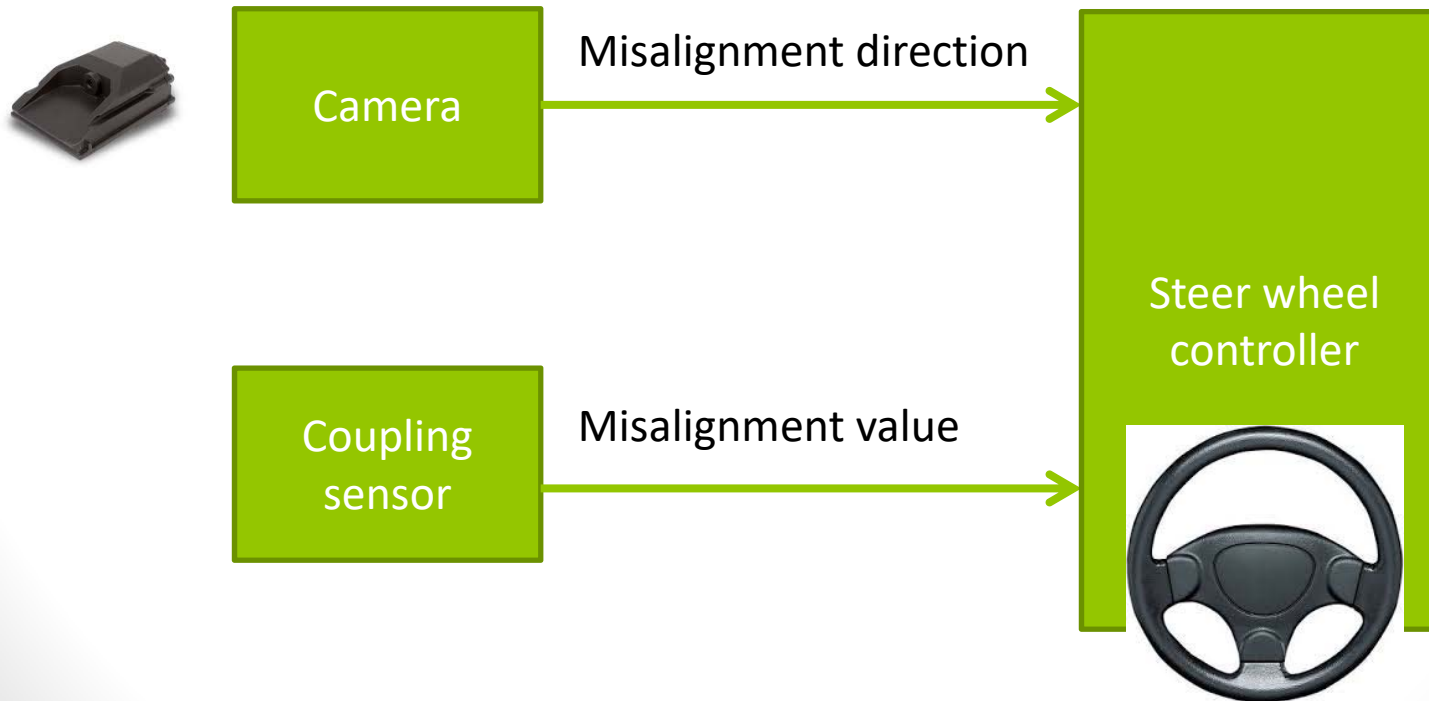
Hwang et al. coil alignment system



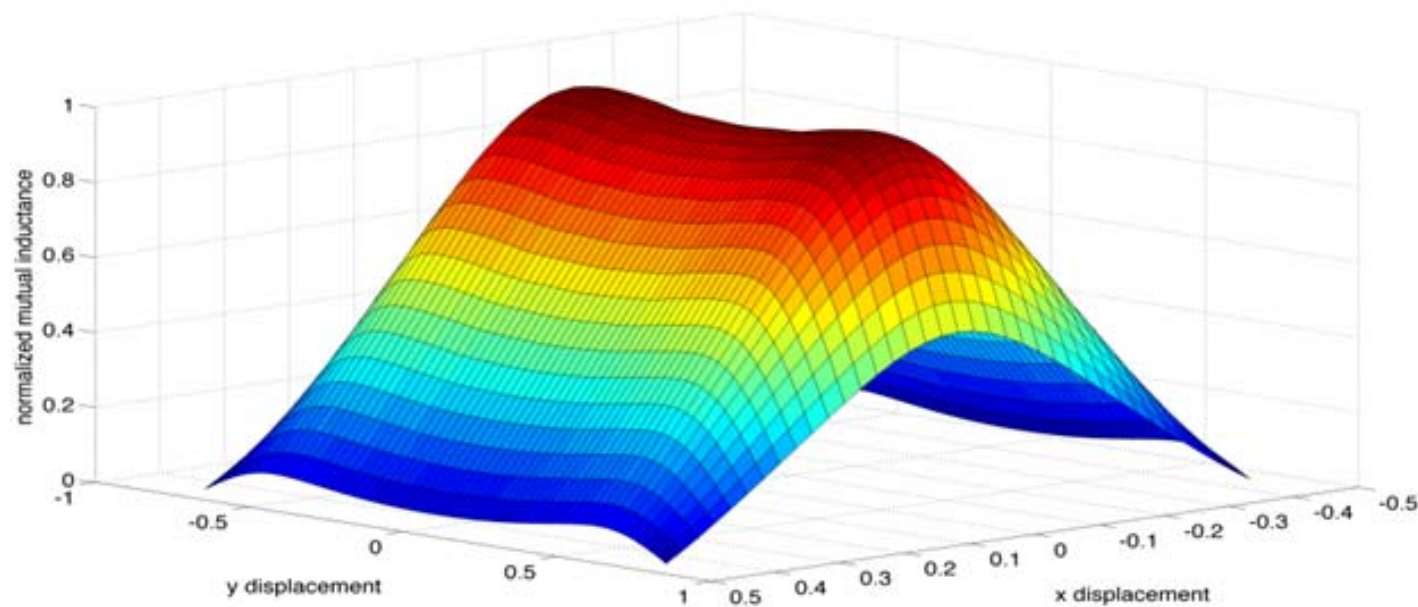
Simulation using carsim and matlab-simulink

FABRIC Coil alignment system

- A coupling sensor can estimate the lateral misalignment value
- The camera can estimate the lateral misalignment direction



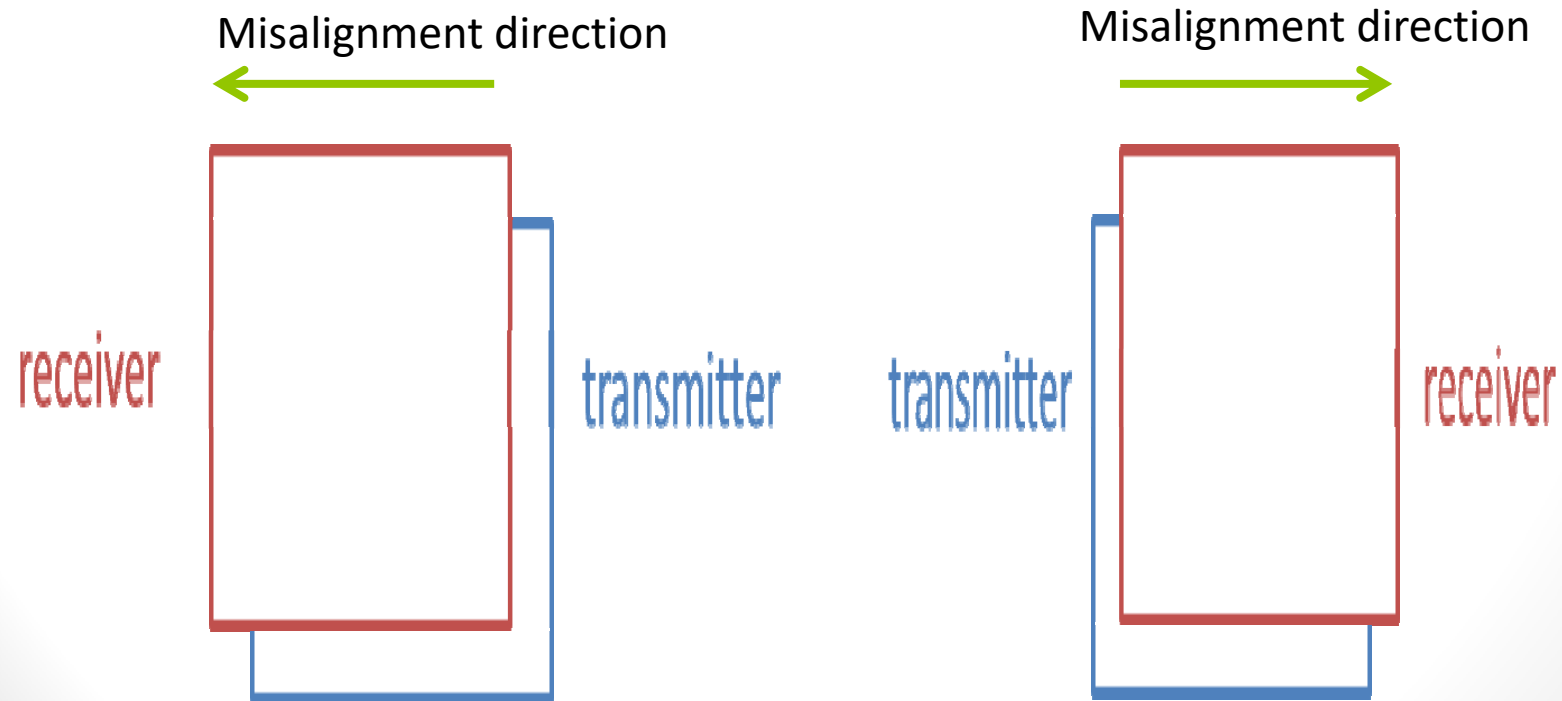
Coupling sensor



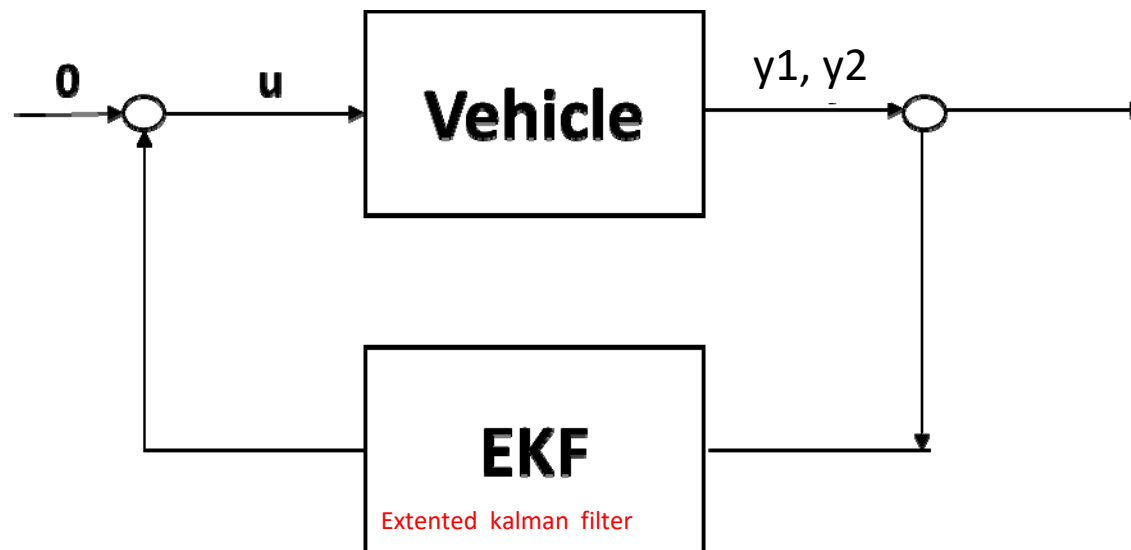
Map of variation of the mutual inductance versus the receiver coil displacement. Values are normalized with respect to the value in perfect alignment condition

Camera

- The camera will measure the misalignment direction



FABRIC Coil alignment system



u : go right , go left

$y1$: camera measurement

$y2$: coupling sensor measurement

Conclusion

- The coupling sensor and the camera can align the receiver and the transmitter and increase the energy transfer efficiency.
- A simulation will be done using different vehicle speeds in straight and curved roads

Thank you

References

- <http://www.cbt.com.my/trials-focus-on-dynamic-charging-for-electric-vehicles/>
- <http://www.electric-vehiclenews.com/2015/08/uk-to-test-dynamic-wireless-charging.html>
- https://en.wikipedia.org/wiki/Plug-in_electric_vehicle