Advanced Modelling and Control of Industrial Electromagnetic Vibratory Systems

Industrial PhD – University of Southern Denmark (SDU) & Newtec Engineering A/S
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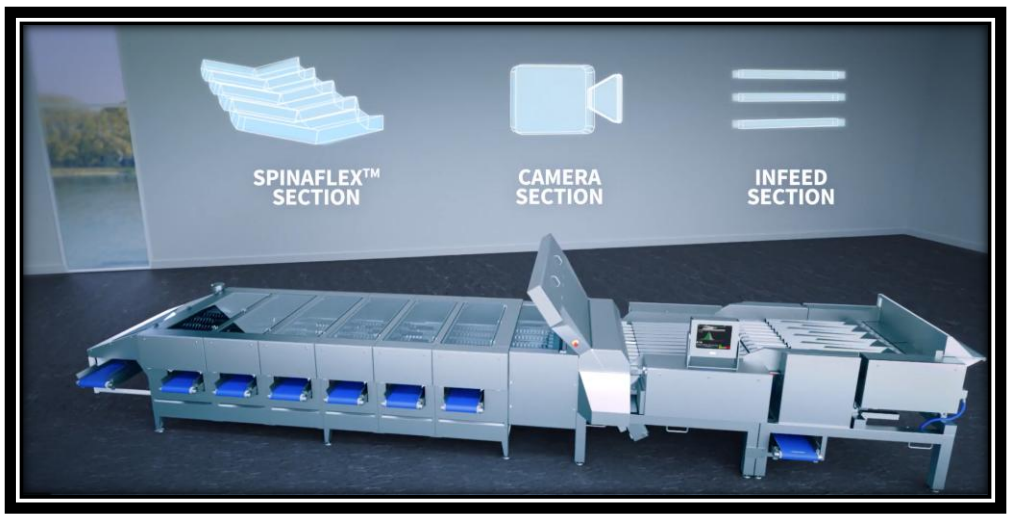


Challenges

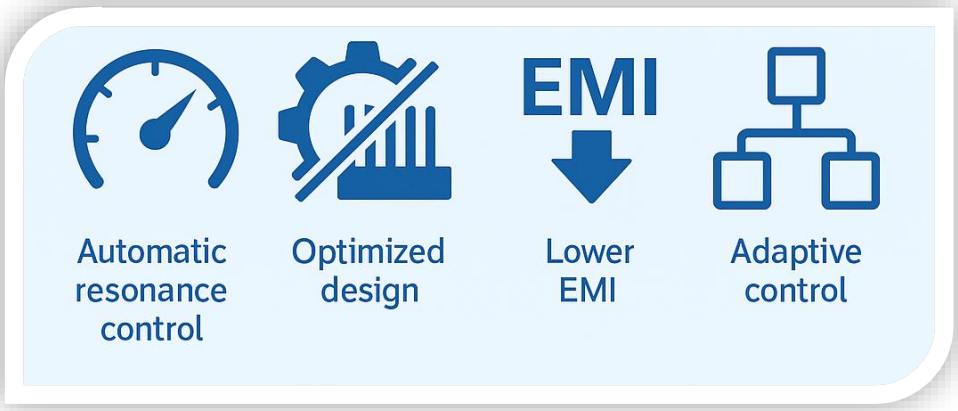
- ❖ Resonance drift creates more than 15 % throughput loss + 300 h/yr downtime.
- ❖ Multi-lane coupling forms standing waves, killing energy efficiency.
- ❖ Legacy TRIAC/thyristor drivers lock to grid frequency, any load change spikes losses.

Solution

- ✓ Integrated mechanical-electrical model predicts resonance.
- ✓ Hierarchical, phase-shifted multi-lane controller cancels standing-wave coupling.
- ✓ Two-stage switch-mode driver replaces grid-locked TRIAC hardware, freeing drive frequency.

Value

- ➢ Automatic resonance control keeps lines at peak throughput and cuts downtime.
- ➢ Optimized driver design removes bulky heat sinks and trims manufacturing cost.
- ➢ Lower conducted EMI ensures compliance with the next wave of EMC standards.
- ➢ Decoupled, adaptive control makes multi-lane systems scalable and stable.



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