BIALYSTOK UNIVERSITY OF TECHNOLOGY

PhD dissertation

**Piotr Nowak**

**Duis vulputate eros sed dolor volutpat,**

**nec aliquam risus pharetra.**

**Phasellus erat arcu, mattis non nunc vitae,   
viverra porta sem**

Field of science: engineering and technology

Discipline of science:

automation, electronics, electrical engineering and space technologies

Faculty of Electrical Engineering

Supervisor: Assistant supervisor:

Assoc. Prof., DSc, PhD, Eng. PhD, Eng.

**Jan Kowalski** **Magdalena Nowak-Kowalska**

Białystok 2023