



## Overview of recent dissertations in the field in Finland

### Functional hard metal surfaces for tribological and antimicrobial applications

#### What is the topic of your doctoral research? Why is it important to study the topic?

Functional hard metal surfaces for tribological and antimicrobial applications. This study allows for the creation of functional structures on cemented tungsten carbide-cobalt (WC-Co) hard metal surfaces by combining a micro-robot technique with metal injection molding (MIM). The developed structures were applied both for tribological and antimicrobial applications.

#### What are the key findings or observations of your doctoral research?

The key findings of this study are: 1. The combination of micro-robot and metal injection molding techniques to fabricate microstructures on hard metal surfaces. 2. The synergy between surface micropits and solid multi-component lubricants for controlled friction and wear at rubbing interfaces.

#### How can the results of your doctoral research be utilised in practice?

The results can be utilized in industries that make use of mechanical machines, to control friction and wear between rubbing surfaces through the combined use of surface micropits and solid lubricants.

#### What are the key research methods and materials used in your doctoral research?

The study utilized both micro robot techniques and metal injection molding (MIM) to fabricate micropits (as lubricant reservoirs) in sliding wear applications, and micropillars as protective pads for antimicrobial copper, and zinc agents.

The doctoral dissertation of MSc **Christopher Kuugna Dawari**, entitled *Functional hard metal surfaces for tribological and antimicrobial applications* was examined at the Faculty of Science and Forestry. The Opponent will be Professor **Elina Huttunen-Saarivirta**, VTT Technical Research Center of Finland, and the Custos will be Professor **Jarkko J. Saarinen**, University of Eastern Finland. Language of the public defence is English. The thesis is available online: <http://urn.fi/URN:ISBN:978-952-61-4578-5>.

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