

Celebrating UNI Innovators

The University of Northern Iowa celebrates innovation across campus and in collaboration with partners across the United States. We are incredibly proud of the technology created and strides made by our faculty and staff—efforts that drive growth and development in many industries and communities.

Tim Kidd



NANOCELLULOSE

Tim has been able to develop low-cost nanocellulose composites that incorporate microcellulose or fine sawdust. The sawdust/nanocellulose composite has surprising flexibility. Both composites are less dense than pure nanocellulose, but retain significant strength. He is continuing to explore the addition of sustainable binders to improve the product. Tim has also received funding from NASA to pursue the production of structural materials, materials for radiation shielding, and gas-permeable membranes derived from nanocellulose. Further research into nanocellulose is incorporated into an EPSCoR grant with Iowa State University and the University of Iowa.

Curt Hanson and Colin Weeks

ROBUST TAGGANT SYSTEM

A system of coded materials that can be added to a wide variety of compositions and “read” by common techniques has been developed and disclosed. Potential markets vary from anti-counterfeiting needs to industries requiring the ability to tag and track materials to work sites as well as industries with materials that are used in or exposed to harsh environments. Our Iowa State University partners have reviewed the data from testing the system and a patent application is under development. On-going work explores detection limits, durability, and lifespan of the materials. Additional work is underway to optimize the production of these coded materials.

Aleksandar Poleksic

IMPROVED METHOD FOR RECOMMENDER SYSTEMS

Aleksandar has developed a novel technique for evaluating the relationships between objects in large databases, such as those used to provide marketing recommendations (e.g. Spotify, Walmart Pharmacy and others). A provisional patent application has been filed and the team is in the process of preparing the patent application. This invention organizes Big Data so that it can be more effectively and efficiently processed, resulting in more accurate results that require less computer processing power. The potential for this technique cuts across several market sectors, including any large database system that seeks to identify patterns of relevance quickly and more accurately than current methods.



The University of Northern Iowa receives about 12 invention disclosures each year.





Tim Kidd and Andrew Stollenwerk

ATOMICALLY FLAT GOLD FILMS

Tim and Andrew have developed a novel process to create atomically flat gold films. They have made improvements and extensions to this process using thin films as substrates. An update to the original provisional patent was submitted in September 2021, and includes the possibility of international protection. The team is exploring partnerships with electronic manufacturers and researchers.

Bettina Fabos

GEOREFERENCED HISTORICAL PHOTO ARCHIVING SYSTEM

Bettina and her team are changing the face of digital photographic archiving. In developing Fortepan.us, a digital-first, user-friendly, and beautifully designed photo archive platform, they are maximizing user engagement and search, creating exhibit tools, and allowing users to embed any filtered version of the archive into other websites. Their new Mainstreet 360° application displays geolocated historical photos onto a 360° plane—they intend to commercialize this application for towns across the U.S. Their next steps are to expand the Fortepan Iowa prototype to other states and countries. This work is supported by the Iowa Cultural Association and private foundation funding.



Jerry Thiel

HA INTERNATIONAL AND BIO-BASED BINDER SYSTEMS

A joint development agreement for the development of bio-based binder systems for 3D printing was entered between UNIRF and HA International in the fall of 2018. The UNI Metal Casting Center and Jerry have been furthering the research to develop new Leonardite sources.

DRY BINDER

Jerry is working with a new application of the humic-based binder for 3D printers. This method is referred to as a dry binder and allows for more of the aggregate to be reused in the 3D printers and foundries.

POST-PROCESSING TECHNOLOGY

Jerry and his team at the Metal Casting Center are developing a post-processing technology for printed sand. This tool will improve its strength and allow for use in small-diameter pipe cores for aerospace magnesium castings and hot stamping dies for the automotive industry.

More than \$1.3 million has been generated in royalty payments over the past two decades. This revenue is then shared with colleges, departments, inventors and the Research Foundation.



Interested in learning more about research and development at the University of Northern Iowa? **Reach out to our leaders directly.**

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