



## **Projects with Commercialization Potential**

## **Technology Transfer Commercialization Process**

The technology transfer process begins with a disclosure of an invention. This is accomplished by submitting an Invention Disclosure Form. The Disclosure provides information necessary for the University to evaluate patentability, inventorship, assignment obligations, the desirability of obtaining patent coverage, and patent obligations to research sponsors. Potentially patentable inventions include any new or useful process, device or apparatus, article of manufacture, composition of matter (including chemical compounds, microorganisms, and the like), or a new use for a known material or device. Such inventions are reported to the Assistant Vice President for Research (AVPR) as soon as possible after conception of the idea. The AVPR makes a preliminary evaluation of the Invention Disclosure. Factors such as patentability, benefit to the public, commercial potential, and patent rights of outside parties are considered in selecting cases to pursue further.

If it is decided to proceed with filing a patent application, the AVPR authorizes and coordinates the process and, in concert with the Office of the General Counsel, a patent attorney is engaged to draft the patent application. In doing so, the inventor works closely with the attorney to complete the application. Once an application is filed, the patent process is a negotiation with the patent examiner in the United States Patent and Trademark Office.

To pursue the licensing of an invention, the AVPR initiates contacts with appropriate companies to assess their interest in obtaining a license to the patent rights (often licensing occurs before the patent issues).

The Office of Research and Sponsored Programs (ORSP) provides a mechanism through which intellectual property developed at the University of North Florida is protected and promoted. Through marketing and licensing activities, the Office brings technology forward to public use and for the benefit of the inventor, the University, and the community. Income is generated for both the inventor and the University through licensing agreements.

{ Reference: (<http://www.techtransfer.fsu.edu/documents/whatistechtransfer.pdf>) }

## **List of UNF Projects with Commercialization Potential**

### **A. Existing Patents**

1. “*Continuously Variable Volume Chamber for Flow Injection*,” US Patent # 6,290,910 B1, Stuart Chalk, September 18, 2001.
2. “*Continuously Variable Volume Chamber for Flow Injection*,” US Patent # 6,358,745 B2, Stuart Chalk, March 19, 2002.
3. “*Emergency Management System*,” US Patent # 6,574,561, John F. Alexander, Gerald U. Merckel and J. David Lambert, June 2003.
4. “*Emergency Management System*,” US Patent # 6,868,340, John F. Alexander, Gerald U. Merckel and J. David Lambert, March 2005.
5. “*Modular Architecture for the Rapid Deployment and Coordination of Emergency Event Field Surveillance*,” US Patent # 6,999,876, J. David Lambert, John F. Alexander and Gerald U. Merckel, February 2006.

### **B. Existing Copyrights**

1. “*STARS (Start Taking Alcohol Risks Seriously)*,” Chudley Werch, September, 2001.
2. “*Orthopedics Multimedia Instruction Materials*,” A Russell Smith, March 2006.

### **C. Patents Pending**

1. “*Delta Detection for Manchester Pulse Coded Modulator (PCM)*,” Susan Vasana.
2. “*Sensing Device and Method Using Photo-Induced Charge Movement*,” Jay Huebner.
3. “*Nanocrystalline Indium Tin Oxide Sensors and Arrays*,” Nirmalkumar G. Patel.
4. “*Growth disruptors of mosquito development- Killing mosquito larvae with natural organic substances*,” Doria Bowers.
5. “*Ontology Converter*,” Sheriff Elfayoumy
6. “*System, Method and Computer Program Product for Concept Based Searching and Analysis*,” Sheriff Elfayoumy

## **D. Pending Copyrights**

1. "*Osprey Scholarship Management System (OSMS)*," Thomas Mills and Melissa Waldron.

## **E. Potential Copyrights**

1. "*Early Literacy and Learning Model (ELLM)*," Cheryl Fountain.

## **F. Current Research Projects with High Potential for Generating Intellectual Property**

1. "*Direct Methanol Fuel Cell Development*," James Fletcher
2. "*Sensor Arrays for Multiple Applications*," Jay Huebner and Nirmalkumar G. Patel.
3. "*Grading Assistant: A User-Friendly, Flexible, and Customizable Software System that Assists Evaluators in the Assessment of Written Documents*," Arturo Sanchez-Ruiz and Bart Welling

## **UNF Projects with Commercialization Potential**

### **A. Existing Patents**

1. ***“Continuously Variable Volume Chamber for Flow Injection,”*** US Patent # 6,290,910 B1, Stuart Chalk, September 18, 2001.

2. ***“Continuously Variable Volume Chamber for Flow Injection,”*** US Patent # 6,358,745 B2, Stuart Chalk, March 19, 2002.

The University of North Florida is developing novel chemical sensing technologies for waterborne pollutants and toxins, for application in the areas of terrorism, environmental monitoring, and process analysis. The system is based on Flow Injection Analysis (FIA) technology providing automated sample preparation and analysis of the desired analyte or analytes. At the heart of the instrument is the Continuously Variable Volume Reactor (CVVR) (US Patent #s 6290910 B1 and 6358745 B2). The CVVR is a mixing chamber that can be computer controlled to have a range of internal volumes (50-1800  $\mu$ L) with its contents mixed at a variety of speeds (1-300 rpm). The automation of the chamber (a replacement for the mixing coil in FIA) means that all variables in the FIA system (flowrate, injected volume, chamber volume and mixing efficiency) can be controlled by computer. Thus, the system can not only be used for a wide variety of analytes (requiring different optimum conditions) but can also accommodate samples that vary in composition. This makes the system ideal for stand-alone remote operation with either local (on-board) or remote (network) control.

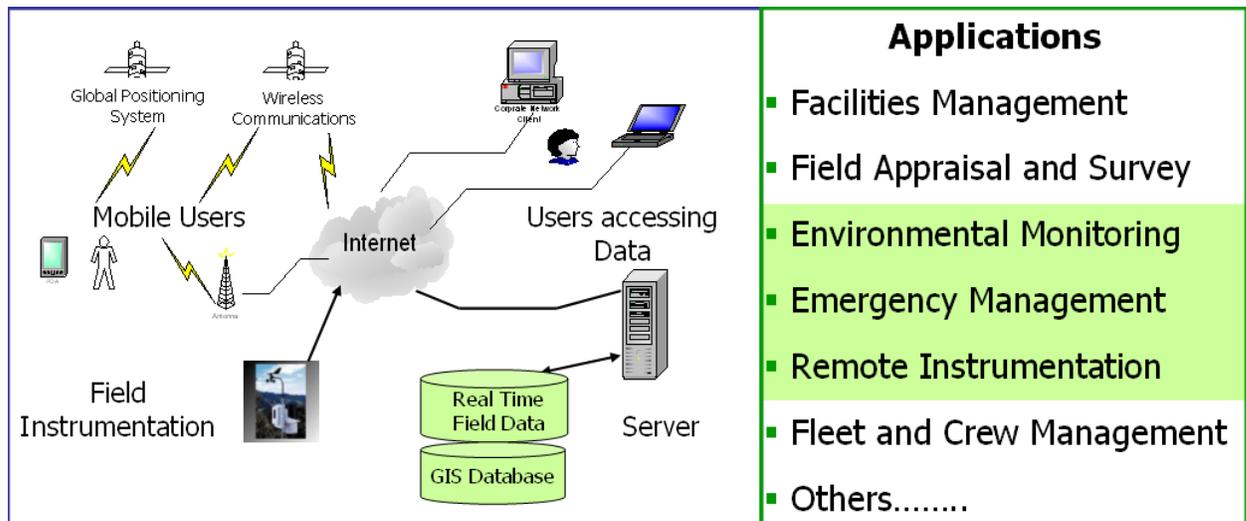
Currently the UNF Office of Research and Sponsored Programs is actively seeking commercial partners for the development of this research into a viable product. The development of some aspects of this technology has been supported, through the efforts of the Florida Congressional Delegation, by the Department of Defense.

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3. ***“Emergency Management System,”*** US Patent # 6,574,561, John F. Alexander, Gerald U. Merckel and J. David Lambert, June 2003.

4. ***“Emergency Management System,”*** US Patent # 6,868,340, John F. Alexander, Gerald U. Merckel and J. David Lambert, March 2005.

5. ***“Modular Architecture for the Rapid Deployment and Coordination of Emergency Event Field Surveillance,”*** US Patent # 6,999,876, J. David Lambert, John F. Alexander and Gerald U. Merckel, February 2006.

These three University of North Florida patents provide intellectual property protection for the Internet based application architecture applied initially to Emergency Management. These patents provided the basis for the UNF high-tech spinout company, **GeoAge** (<http://www.directionsmag.com/companies/GeoAge/>). The overall systems' architecture is shown in the following figure.



These patents have been licensed to GeoAge on an exclusive basis. GeoAge, now led by a UNF alumnus, has grown significantly in the last couple of years and has gone into partnership with the likes of **Microsoft** and **Alltel**.

*The successful spin out of GeoAge demonstrates that our faculty have the capability to develop research products with widespread commercial applications and that we know how to take projects from intellectual property disclosure to successful commercialization.*

## B. Existing Copyrights

1. “**STARS (Start Taking Alcohol Risks Seriously)**,” Chudley Werch, September, 2001.

Years of research at the University of North Florida led to the design of effective health promotion strategies for preventing alcohol use among middle and junior high school youth. This multi-component program includes media-related interpersonal and environmental prevention strategies. It has been shown to result in avoidance of and/or reduction in alcohol use among participating youth. This product is currently licensed to NIMCO, a distributor in Calhoun, Kentucky.

2. “**Orthopedics Multimedia Instruction Materials**,” A Russell Smith, March 2006.

Research at the University of North Florida has resulted in the development of a set of interactive training materials that facilitate the learning process on how to correctly perform the skills needed to examine and treat the extremities and spine of the human body. Orthopedics I consists of 3 CDs: one with 58 distinct skills for the Upper Extremities, one with 53 distinct skills for the Lower Extremities and one with 23 distinct skills for the Spine. The University seeks a national distributor and/or promotional partnership to enhance the marketing of this software.

## C. Patents Pending

### 1. *“Delta Detection for Manchester Pulse Coded Modulator (PCM),”* Susan Vasana.

The University of North Florida is developing a special detection method to detect the Manchester coded data, which is delta detection. Manchester codes are widely used in data storage and communications for its unique property. The advantages of the system developed at UNF include increased detector sensitivity, lower transmission power, lower detection error rate, reduced costs for system/data clocks, and less interference with other users.

### 2. *“Sensing Device and Method Using Photo-Induced Charge Movement,”* Jay Huebner.

The University of North Florida is developing novel chemical sensing technologies based on molecular recognition, with applications to the detection of many clinical, environmental, and industrial analytes, as well as toxins which might be employed by terrorists. This sensing technology uses photo-induced charge movements (PICM) on sensor surfaces in the aqueous solutions being analyzed. The analytes are detected via their interactions with PICM Active Materials (PAMs), which can be dyes that are fixed on sensor surfaces. Brief light flashes generate analog signals that are amplified, digitized and analyzed. Specific interactions between the analyte(s) and PAMs modify the PICM signals, allowing the presence and concentrations of the analytes to be determined. We are developing multi-electrode sensors arranged in matrices that can function simultaneously with multi-channel digitizers to allow multiple analytes to be detected on a single flash. Further development to allow remote control of these sensor devices is being pursued. We currently have a Florida company with active interest in this technology and the UNF Office of Research and Sponsored Programs is actively seeking other commercial partners for the development of this technology into a viable product. The development of this technology has been supported, through the efforts of the Florida Congressional Delegation, by the Department of Defense.

### 3. *“Nanocrystalline Indium Tin Oxide Sensors and Arrays,”* Nirmalkumar G. Patel.

The University of North Florida is developing sensors that can be used to detect chemical warfare agents, industrial toxic chemicals and poisonous gases. This technology involves the design and fabrication of Indium Tin Oxide (ITO) thin films gas sensors arrays for use in the detection of chemical warfare agents (CA) such as Phosgene (CG) gas, samon (GD), mustard (HD) and VX. These sensors have been tested at the U.S. Army Edgewood Chemical Biological Center (ECBC) and have demonstrated the capacity to detect several gases including CO, O<sub>3</sub>, acetylene, propane, industrial toxic chemicals such as Acetonitrile, Chloropicrin (PS), Cyanogen chloride (CK), Dimethyl Methyphosphonate (DMMP), 1- and 2-proponal, Methyl salicylate, Thioxande,

Triethanolamine. Other potential non-defense applications of this technology are as bio-sensors. We currently have a Florida company with active interest in this technology and the UNF Office of Research and Sponsored Programs is actively seeking other commercial partners for the development of this technology into a viable product. The development of this technology has been supported, through the efforts of the Florida Congressional Delegation, by the Department of Defense.

4. ***“Growth disruptors of mosquito development- Killing mosquito larvae with natural organic substances,”*** Doria Bowers.

Research on mosquitoes has resulted in a new method of mosquito control that is environmentally effective and friendly. Mosquito control is achieved through inhibiting insect development during the immature aqueous stage of its complex lifecycle prior to emergence of biting adults. Natural biodegradable substances are used in the interruption of the insect lifecycle. This technology will minimize the toxic effects of currently used pesticides. The UNF Office of Research and Sponsored Programs is actively seeking commercial partners for the development of this technology into a viable product.

5. ***“Ontology Converter,”*** Sheriff Elfayoumy

6. ***“System, Method and Computer Program Product for Concept Based Searching and Analysis,”*** Sheriff Elfayoumy

These two inventions are data mining applications used in conjunction with proprietary software applications to look for relationships and patterns among documents. UNF is currently negotiating with the company, Intelgenxia, which owns the proprietary applications to determine the University’s interest in these technologies.

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## **D. Pending Copyrights**

1. ***“Osprey Scholarship Management System (OSMS),”*** Thomas Mills and Melissa Waldron.

This is a scholarship management system intended for colleges and universities, and their foundations, alumni and development offices. It is used for recordkeeping, communicating, reporting, and performing compliance for scholars. It also serves as a tool to manage information about scholarships, students, offer and renewal letters, and donors. It is useful for tracking and evaluating scholars’ compliance with the provisions of particular scholarship. This software was created to enable donors get timely and better information and a reporting system to assist in their mentoring programs, identifying current and future scholars, and predicting scholarship awards. The University seeks a national distributor and/or promotional partnership to enhance the marketing of this software.

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## **E. Potential Copyrights**

### **1. “*Early Literacy and Learning Model (ELLM)*,” Cheryl Fountain.**

ELLM, a research- and standards-based curriculum and professional development support system, is designed to improve the language and pre-literacy skills and knowledge of 3-, 4-, 5, and 6-year-old children. These include developing oral language, phonemic awareness, motivation to read, print awareness, and letter knowledge. ELLM provides caregivers, teachers, and families with the tools to help young children acquire the early literacy skills they need to become proficient readers. The ELLM program has served urban children in a wide variety of early childhood education sites: Head Start centers, subsidized centers, private and faith-based centers, and elementary schools.

UNF currently markets research-based Literacy Packets, books and curriculum materials to the pre-school community throughout Florida. The University seeks a national distributor and/or promotional partnership to enhance the marketing of the ELLM curriculum and materials.

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## **F. Current Research Projects with High Potential for Generating Intellectual Property**

### **1. “*Direct Methanol Fuel Cell Development*,” James Fletcher**

Leveraging emerging advances in academic research, membrane development, and systems integration, a team led by the University of North Florida is partnering with PolyFuel (a California-based company) and the University of Florida (UF) to develop and demonstrate technologies to extend the run-time and reduce logistical requirements for military notebook/laptop computers. The proposed project will develop, demonstrate and prototype a ruggedized direct methanol fuel cell (DMFC) powered laptop power supply for all day, wireless mobile computing. This project is currently funded by a \$2 million grant from the Department of Defense. The research products from this project are likely to lead to commercializable intellectual property.

### **2. “*Sensor Arrays for Multiple Applications*,” Jay Huebner and Nirmalkumar G. Patel.**

This is a continuation sensor development project supported by grants from the Department of Defense. The first two phases of this project has already resulted in patent pending research products (see items 2 and 3 under Patent Pending). The follow-on research has the potential of resulting in additional patentable research products. This research is currently supported, through the efforts of the Florida Congressional Delegation, by the Department of Defense.

3. ***“Grading Assistant: A User-Friendly, Flexible, and Customizable Software System that Assists Evaluators in the Assessment of Written Documents,”*** Arturo Sanchez-Ruiz and Bart Welling

This is a software system that assists evaluators in the assessment of typically large sets of electronically submitted papers, such as essays, reports, project descriptions, theses, etc. The fundamental approach to the assessment of a document consists of identifying the use of previously catalogued writing patterns and anti-patterns, collectively referred to as “patterns.” This product is currently under review to determine its patentability.