



Position Description

Clynch Technologies Inc (CTI) has an immediate need to fill a research and development position within its DeltaSystems team. This position involves the development of a software prototype in the application of biometrics or “measurement frameworks” in the specification, design and fabrication of body molds used in the bio-medical industry with current emphasis on prosthetic/orthotic care and radiation therapy.

Overview

DeltaSystems represents a new technology applying computer-aided specification, design, and fabrication within the prosthetic and orthotic care industry. It was designed to offer practitioners a technically and clinically efficient method of providing prosthetic and orthotic care with the ability to obtain repeatable results without compromising quality.

The major components within DeltaSystems include a laser scanner to record a precise and detailed digital representation of the patient’s body shape, a suite of smart computer aided design modules that use this digital representation to design the required prosthetic or orthotic, and a suite of computer aided manufacturing modules that fabricate the finished device from these designs.

The small size and relatively large cost associated with laser imaging means that most practices are unable to afford in-house laser imaging. DeltaSystems currently addresses this issue by using a patented synthetic sock casting method enabling smaller practices to obtain lightweight casts locally which can be sent to centralized scanning facilities.

This method however adds several days to the time taken to provide the needed patient care and introduces extra shipping and handling costs. There are also some applications, such as trans-femoral and upper-extremity prosthetics for which laser scanning proves difficult.

The purpose of this proposed research and development project is to determine a potential solution to these problems through the use of defined biometrics or measurement frameworks to capture the required body shape with a level of quality comparable to that of laser imaging.

Research & Development Goals

The ultimate goal of this work will be to define a number of measurement frameworks that can be used for the production of a range of prosthetic, orthotic, bracing and support applications. These frameworks must be cost effective, efficient, and easy to use by practitioners and generate clinical results that are as good if not better than those obtained by laser imaging.

The goals of this specific study will be to determine a set of measurement frameworks that can be used to specify, design, and fabricate trans-femoral prosthetics. This will be accomplished through the development of a prototype product that will be used to produce trans-femoral prosthetics in this manner.

It is anticipated that this work will provide a new module for DeltaSystems that can be made available to existing and new DeltaSystems customers. It is also hoped that the work will form the basis of adding additional measurement frameworks to DeltaSystems allowing us to offer more efficient and cost effective services to smaller practices.

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Research Objectives

- Development of one or more measurement frameworks for the design and fabrication of trans-femoral prosthetics
- Development of tools & techniques to improve the accuracy and repeatability obtained from by measurement design and fabrication
- Determine the accuracy and repeatability of these methods compared with other methods including plaster/synthetic sock casting and laser imaging,
- Conduct initial clinical trials in conjunction with Clynch Prosthetic & Orthotic Laboratory. Trials will require the design, fabrication, and fitting of a minimum of 5 trans-femoral prosthetic limbs
- Development of computer aided design and fabrication modules for the DeltaSystems application
- Conduct secondary clinical trails in conjunction with select DeltaSystems customers

Context

This research and development will be conducted as part of CTI's ongoing efforts in the development, diversification, and commercialization of their bio-medical computer aided design and fabrication system called DeltaSystems. DeltaSystems represents a group of commercially available products and services currently targeted at the prosthetic and orthotic industry.

This current work will build on earlier work that focused on defining a measurement framework for trans-femoral prosthetics. It is hoped that efforts from this study will refine and generalize the measurement framework concept, provide a commercial trans-femoral product/service and form the foundation for offering a similar service for other bio-medical applications.

Required Knowledge & Skills

CTI will select a candidate based on the strength of their academic record, research skills and experience and the suitability of their skills and knowledge to the proposed position. Important knowledge and skills include:

- MSc or PhD in the computing science, engineering, or other related field: The applicant must have or be within three months of completing their degree. Applicants who already hold the degree must have obtained it within the last five years.
- Software development: The applicant must have solid and demonstrated software development experience. Preference will be given to candidates with experience in developing commercial software applications. Knowledge of development in C++ in a Microsoft Windows environment using Visual Studio V6.0 is essential. Working knowledge of software development processes and practices is also required.
- Communication: The applicant must possess excellent English written and verbal communication. The role will involve a significant amount of communication between technical, clinical, and management personnel. The applicant must be capable of communicating potential complex concepts in terms understandable by the various groups involved.

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- Working Style: The applicant must be capable of working within a small heterogeneous team environment and of working for long periods in a self-directed/motivated manner. The applicant must have excellent multi-tasking skills.
- Computer graphics: The applicant should be familiar with 3D computer graphics principles and practices. Preference will be given to applicants with a demonstrated knowledge of OpenGL in a Microsoft Windows environment
- Bio-medical: Knowledge of human anatomy and physiology, although not essential, would be a benefit.

Funding

This position is contingent on continued funding through the Alberta Ingenuity r&D Associate Program. Once a candidate is selected, CTI will make an application for funding. Application deadlines are December 1, February 1, April 1, June 1, August 1, and October 1 with results approximately six weeks after.

Location, Start Date and Term

The successful applicant would be expected to work at CTI's offices in Calgary. CTI can cover some or all of any relocation expenses. The start date would be as soon as possible after funding is obtained but no later than 3 months after this date. The term would initially be for one year with an option to continue for one extra year and with the possibility of a full time position after the second year, contingent on research results, business case, and funding.

About Clynch Technologies Inc (CTI)

CTI is a bio-medical technology company with a mission to combine the problem solving and design precision of science and engineering with the medical expertise of health care professionals to deliver innovative new products and services to the global health care industry. We strive to be the leading provider of advanced solutions that are easier to use and maintain, that are more adaptable, reliable, and powerful than any other available. We aim to provide our customers with training and support enabling them to provide world class services and improve patient health care and the quality of life of individuals everywhere.

We wish to build a future where health care is individual-specific, customized, made-to-measure and accessible by all; where everyone can receive quality, personalized health care that will work for them and at a cost they can afford. We are developing this future by removing the trial-and-error of providing health care with the knowledge and precision of a scientific and engineering procedure that allows better, customized, patient-specific health care to be delivered efficiently, effectively, at lower cost, and higher quality.

Through the products and services we will develop we are striving to allow health care professionals to deliver the highest quality care possible through deeper understanding, more precise patient specific information, and access to the latest medical and technical knowledge, materials, and capabilities. We are fully committed to a future where patients everywhere recover more quickly and more comfortably and can lead happier, safer, fuller, and healthier lives.

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More Information

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