Dear Eugeniu,
Here is the copy of the Project Pitch with reference number : **00046888** submitted to the **Learning and Cognition Technologies (LC)** on **3/31/2022**.

1. Submitter Name

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7. SBIR/STTR topic that best fits your projects technology area

   Learning and Cognition Technologies (LC)

8. Is this Project Pitch for a technology or project concept that was previously submitted as a full proposal by your company to the NSF SBIR/STTR Phase I Program – and was not awarded ?

   No

9. Has your company received a prior NSF SBIR or STTR award?

   No

10. Does your company currently have a full Phase I SBIR or STTR proposal under review at NSF?

    No

11. Briefly Describe the Technology Innovation?

Typing has gained the status of an essential skill in the informational era - the digital world which we live in.

Whether a student is working on a homework assignment on a computer, a software engineer is writing a program, or a CEO is crafting his pitch for investors - typing is used as a ubiquitous way of crafting messages and recording ideas on a computer.

However, typing is not a natural activity and it requires special training in order for a person to master any level of fluency at typing. In addition, inability to touch type often affects efficiency and mental state of people working with computers.

The most efficient, globally recognized typing technique is known as touch typing. A person capable of touch typing can type using all fingers, without the need of seeing the keyboard. Touch typing is mastered through development of typing motion reflexes, synchronized with the brain areas involved in speech and other verbal activities.

First keyboard for typing was invented in 1714 - more than 300 years ago.

Since then the keyboards have gone a long way from mechanical typewriters to sophisticated ergonomic keyboards used to type and communicate via computers. However, we are still learning typing using rote learning - the same approach used to teach typists for centuries.

With the development of modern technologies it is possible to better understand how we type, and based on this knowledge we can develop a more flexible technique for learning typing.

Eugeniu Rotari, the PI of the current proposal, has developed a computer algorithm, which allows registering and analyzing computer keyboard events, such as key presses, with further extraction of typing patterns of people with different levels of expertise in touch-typing.

Ultimately a device which allows for instruction-free mastering of touch -typing without the need for special practicing of typing was developed and patent # US1377070A successfully passed the reviewing stage and was granted by the USPTO in 2020.

Although the core principles and supporting ideas were successfully established and tested, it was discovered that people from different groups, differentiated by age or health conditions, might need a tailored approach.

Sir Arthur Conan Doyle once said: “The little things are infinitely the most important.” Today there are over 240 millions of keyboards around the world. We believe that improving the way people are learning typing - even by a fraction - will have a scalable impact on the way millions of people write, communicate, create computer code, think and stay focused better while using computers.

12. Briefly Describe the Technical Objectives and Challenges?

In phase I of this project we will develop a system for registering finger movements, keyboard events and tracking eye movements in the real time. This system will consist of a computer with a keyboard suited for typing biometrics, a commercial eye-tracking technology, N-VIDIA AI Nano computer equipped with a human body motion analysis module and corresponding software, to register human behavior with the said sensors.

The new system will let us better understand the mechanisms behind typing and will help us develop the knowledge needed for creation of new methods for teaching and learning touch typing.

Ability to focus - is an essential quality for people, which determines success in learning, for being efficient at work and in achieving goals.

On the other hand - success in learning and professional life nowadays is often compromised by distractions. This project will develop a system, which will help people, starting at a young age, develop healthy typing habits, with minimized chances of being distracted, by minimizing discomforts associated with the need to look away from the screen. Additionally, facilitation of developing the touch typing skills will help young students and adults preserve emotional health and valuable mental resources.

Development of a system for simultaneous digitization of the hand and eye movements will provide as the means for distinguishing slight changes in typing behavior.

Ultimately, the development in this project system will be used as a primary benchmark for development and characterisation of various modifications of Keyboard Finger Guides (mentioned in &13).

As it was highlighted in &13, development tailored to an individual Keyboard Finger Guides will help people of different ages and health groups master touch typing without the need for undertaking typing courses and eliminating the need for spending time on mastering touch typing skills.

One of the challenges in teaching typing is a lack of flexible and reliable metrics. Up to date the primary measure of typing proficiency is the WPM (Words-Per-Minute)rate. Although it might reflect ability to speedtype - it does not reflect abilities to concentrate, or otherwise to maintain focus during work at computers.

There is no distinct difference between touch typists and those who cannot touch type. This difference appears as a number of qualities, which people may have. Among those are abilities to use all fingers for typing and all fingers demonstrating comparable agility. Another criterion - is an ability to locate each key without seeing the keyboard, reliant on tactile senses only.

In this project, we aim to develop a system, which would help us measure those variables, which contribute to the touch typing skill.

Although creating a system which will allow us to monitor finger and eye movements during typing can be defined as straightforward engineering, the efficiency of this system for measuring progressive accumulation of the touch typing skill remains uncertain.
Therefore, this project will also require experimentation and search for efficient solutions to the problem, which align well with the definitions of the RnD activity in the CFR § 200.87.

13. Briefly Describe the Market Opportunity?

Computer keyboard today - is the primary means for creating textual content by people of all ages and backgrounds.

In 2022 about 4 million students are expected to graduate from high schools in the US. However, only a fraction of graduates can touch type.

Computers have become widely available in many households and schools nationwide.

However, only a fraction of all school graduates are capable of touch typing. According to a poll organized by ViaTyping, less than 20% of young IT professionals are capable of touch typing.

Touch typing - remains a skill, available to the ones, who attended dedicated typing courses, either online or with an instructor in person.

In this project we will create technology, which will demonstrate quantitatively the benefits of touch typing, and will provide support for the idea that it is possible to master touch typing without the need of attending special typing courses.

New technology will demonstrate the feasibility and the need for commercializing keyboard finger guides, and effectiveness of newly developed approach to instruction free and practice free learning of touch typing using keyboard finger guides exclusively.

14. Briefly Describe the Company and Team?

Eugeniu Rotari - has received his MSc. in Chemistry in 2002. After joining CREOL (Center for Research and Education in Optics and Lasers) at the University of Central Florida in 2002, joined and consequently led the RnD department at OptiGrate Inc. In 2017 Eugeniu started independent research and developed a novel approach to instruction-free learning of touch typing. In 2021 Eugeniu founded ViaTyping, a company focused on studying typing biometrics, and promoting new technology of keyboard finger guides.

Julia Bello - is a councilor and professional coach holding an MSc degree in psychology. Julia is a co-founder of ProPsy, a mental health informational agency dedicated to promoting available mental health services. Currently, Julia is a professional job coach at the EmployU, a nonprofit career building organization. There Julia provides long-term support, job development, and on-the-job training to people with health disorders. Julia will share her knowledge and expertise in finding solutions to the challenges associated with learning, development and formation of new skills.

Alexandr Nekhai - has received his bachelor’s degree in applied mathematics with the major in financial analysis. Between 2007 and 2015 Alexander held the position of financial advisor and data analyst at the Belorussian State Bank in Minsk and in 2017 immigrated to the US. Alexander will share his expertise in statistics and systematic data analysis.

Vladimir Sklyarov - is a technician at Atkins NA - worldwide engineering consulting company where he supports Orlando and national Geomatics groups with data processing and analysis, CAD production, training, remote sensing in geotechnology, business automation. Vladimir also has experience in software and database development, computer and network infrastructure, and is researching AI and cloud based architectures.

15. How did you first hear about our program?

General web search or social media advertisement

NSF SBIR/STTR Phase I Eligibility Information:

In addition to receiving an invitation to submit a full proposal from the NSF SBIR/STTR Phase I Program based upon the review of their submitted Project Pitch,potential proposers to the program

must also qualify as a small business concern to participate in the program (see SBIR/STTR Eligibility Guidefor more information).
The firm must be in compliance with the SBIR/STTR Policy Directive(s) and the Code of Federal Regulations (13 CFR 121).

- Your company must be a small business (fewer than 500 employees) located in the United States. Please note that the size limit of 500 employees includes affiliates.
- At least 50% of your company's equity must be owned by U.S. citizens or permanent residents, and all funded work needs to take place in the United States (including work done by consultants and contractors).
- Primary employment is defined as at least 51 percent employed by the small business. NSF normally considers a full-time work week to be 40 hours and considers employment elsewhere of greater than 19.6 hours per week to be in conflict with this requirement.
- The Principal Investigator needs to commit to at least one month (173 hours) of effort to the funded project, per six months of project duration.

For more detailed information, please refer to the SBIR/STTR Eligibility Guide by using https://www.sbir.gov/sites/default/files/elig_size_compliance_guide.pdf. Please note that these requirements need to be satisfied at the time an SBIR/STTR award is made, and not necessarily when the proposal is submitted.