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Tekniske Videnskaber

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To
The Novo Nordisk Foundation
The Data Science Investigator Committee

18. februar 2021

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

With this letter, we would like to express our strong support for the suggested project on "Digital Phenotyping" by Professor Jakob E. Bardram.

We find that the proposed technology platform offers a promise of significant impact on biomedical and health data science which could lead to significant benefits to our academic and industrial members. This will improve the development of data-driven health technology in Denmark with important benefits to industry, the healthcare system, and the country at large.

ATV have a strong focus on health technology and have recently published a national white book on "Better Health with Artificial Intelligence" (https://atv.dk/en/node/1468). The observations and recommendations presented in this white book aligns perfectly with this project. A core recommendation is to "Establish a health data science training gym", i.e. a place where health data science methods and technologies can be developed, implemented, validated, and used. And this should take place in an open public-private research partnership.

ATV sees this project as a core enable of this vision. This project is an open science initiative which will help share knowledge, technology, and teaching across universities, clinics, and industry.

Looking ahead, we firmly believe that digital phenotyping technology and its ability to collect ambulatory longitudinal data from mobile and wearable devices will play an increasing role in health care systems worldwide. Therefore, this type of technology is important to master for our industrial members in order to enable them to create innovative products for the benefit of clinics and ultimately patients.

Yours sincerely,

Lia Leffland
Managing Director

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

To The Novo Nordisk Foundation
The Data Science Investigator Committee

February 8, 2021

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

I hereby strongly support the suggested project on "Digital Phenotyping" by professor Jakob E. Bardram. This line of research and the proposed technology platform offer a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with mental disorders.

Digital phenotyping technology and its ability to collect ambulatory longitudinal data from patients' everyday behavior will play an increasing role in the diagnosis and treatment of mental health. I am uniquely qualified aid this project. First, I have a history of ongoing work in the technology mental health space and have published over 200 papers on the topic. I have research support from the NIMH, Wellcome Trust, and foundations to study mental health though digital phenotyping – a term I helped define in 2016. Having created an open source mental health technology platform (mindLAMP) now used in research at many sites such as Mayo Clinic, University of Toronto, Monash University (Australia) and Oxford (UK) – I will be able to offer input on the technical side of this work as well and help ensure the technology is synergistic with the research question and clinical impact.

The real novelty of this proposal is its focus on the creation of reusable components for digital biomarker collection, extraction, and annotation. Such a general-purpose platform for digital phenotyping with reusable components would leverage biomedical and health data science for ambulatory and continuous diagnosis and treatment to a completely new level, as compared to the current state-of art in digital phenotyping.

It is a pleasure to join this project as a member of the international scientific advisory committee and I am looking forward to engage in a closer collaboration on this project. Especially, I would be interested in the design and reuse of the technology components coming out of this project. Moreover, I welcome PhD students from this project to work with me at Harvard Medical School.

I believe, that with its focus on researching, designing, and implementing digital phenotyping technology this project will help build a strong capacity in Denmark and internationally within both education, research, clinical trials, and industrial applications.
Best,

John B. Torous MD MBI
Director: digitalpsych.org @BIDMC, Assistant Professor @ Harvard Medical School

HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

Prof Cecilia Mascolo
Professor of Mobile Systems
Fellow of Jesus College

UNIVERSITY OF CAMBRIDGE
Computer Laboratory

9 February, 2021

To: The Novo Nordisk Foundation
The Data Science Investigator Committee

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

I hereby strongly support the suggested project on "Digital Phenotyping" by Professor Jakob E. Bardram. This line of research and the proposed technology platform offer a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with chronic diseases.

I am one of the two directors of the Centre for Mobile, Wearable Systems and Augmented Intelligence, Cambridge University which has one important component related to application of wearable systems research into health and the recipient of a European Research Council Advanced Grant on use of audio for medical diagnostics. I further collaborate with clinicians on applied mobile systems projects related to mental health, medical adherence, dementia diagnosis and smoke cessation.

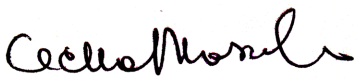
The real novelty of this proposal is its focus on the creation of reusable components for digital biomarker collection, extraction, and annotation. Such a general-purpose platform for digital phenotyping with reusable components would leverage biomedical and health data science for ambulatory and continuous diagnosis and treatment to a completely new level, as compared to the current state-of art in digital phenotyping.

It is a pleasure to join this project as a member of the international scientific advisory committee and I am looking forward to engaging in a closer collaboration. Especially, I would be interested in the design and reuse of the technology components coming out of this project. Moreover, I welcome the idea of PhD students from this project to collaborate with my group.

I believe, that, with its focus on researching, designing, and implementing digital phenotyping technology, this project will help build a strong capacity in Denmark and internationally within both education, research, clinical trials, and industrial applications.

Please do not hesitate to contact me if you need further clarifications.

Yours Faithfully,



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Biography: Cecilia Mascolo is the mother of a teenage daughter but also a Full Professor of Mobile Systems in the Department of Computer Science and Technology, University of Cambridge, UK. She is co-director of the Centre for Mobile, Wearable System and Augmented Intelligence and Deputy Head of Department for Research. She is also a Fellow of Jesus College Cambridge and the recipient of an ERC Advanced Research Grant. Prior joining Cambridge in 2008, she was a faculty member in the Department of Computer Science at University College London. She holds a PhD from the University of Bologna. Her research interests are in mobile systems and machine learning for mobile health. She has published in a number of top tier conferences and journals in the area and her investigator experience spans projects funded by Research Councils and industry. She has received numerous best paper awards and in 2016 was listed in “10 Women in Networking /Communications You Should Know”. She has served as steering, organizing and programme committee member of mobile and sensor systems, data science and machine learning conferences. More details at www.cl.cam.ac.uk/users/cm542

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University of California
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advancing health worldwide

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February 8, 2021

To The Novo Nordisk Foundation
The Data Science Investigator Committee

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

I hereby strongly support the suggested project on "Digital Phenotyping" by Professor Jakob E. Bardram. This line of research and the proposed technology platform offer a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with mental disorders.

Digital phenotyping technology and its ability to collect ambulatory longitudinal data from patients' everyday behavior will play an increasing role in the diagnosis and treatment of mental health. As a primary care clinician, I can verify the importance of mental health in the overall health of patients. I have led several digital health monitoring projects on primary care patients with depression, and the need for more automated, nuanced, and predictive mental health digital biomarkers is indisputable.

The real novelty of this proposal is its focus on the creation of reusable components for digital biomarker collection, extraction, and annotation. Such a general-purpose platform for digital phenotyping with reusable components would leverage biomedical and health data science for ambulatory and continuous diagnosis and treatment to a completely new level, as compared to the current state-of art in digital phenotyping.

It is a pleasure to join this project as a member of the international scientific advisory committee and I am looking forward to engage in a closer collaboration on this project. Especially, I would be interested in the design and reuse of the technology components coming out of this project. Moreover, I welcome PhD students from this project to collaborate with me at the University of California, San Francisco School of Medicine.

I believe, that with its focus on researching, designing, and implementing digital phenotyping technology this project will help build a strong capacity in Denmark and internationally within both education, research, clinical trials, and industrial applications.

Sincerely,

Ida Sim, MD, PhD
Professor of Medicine, UCSF
Co-Director of Informatics and Research Innovation, UCSF Clinical and Translational Sciences Institute
Co-Founder, Open mHealth
Co-Founder, Vivli

To The Novo Nordisk Foundation
The Data Science Investigator Committee

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

I hereby strongly support the suggested project on "Digital Phenotyping" by Professor Jakob E. Bardram. This line of research and the proposed technology platform offer a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with chronic diseases.

In our work here in Oulu mobile phones have proven as invaluable proxies for human behaviour and for collecting both objective and subjective data through different crowdsourced approaches. Related to health specifically, we leverage digital phenotyping with e.g. with Parkinson's Disease, Low Back Pain, and Depression. I am familiar with Professor Bardram's past and planned research on this topic and am confident that we will be among the very first ones to use and benefit from the platform he will contribute with the help of this grant.

The real novelty of this proposal is its focus on the creation of reusable components for digital biomarker collection, extraction, and annotation. Such a general-purpose platform for digital phenotyping with reusable components would leverage biomedical and health data science for ambulatory and continuous diagnosis and treatment to a completely new level, as compared to the current state-of art in digital phenotyping.

It is a pleasure to join this project as a member of the international scientific advisory committee and I am looking forward to engage in a closer collaboration on this project. Especially, I would be interested in collaborating on the design and reuse of shared, reusable technology components. Moreover, I welcome PhD students from this project to work with me at the University of Oulu.

I believe, that with its focus on researching, designing, and implementing digital phenotyping technology this project will help build a strong capacity in Denmark and internationally within both education, research, clinical trials, and industrial applications.

Best,

Associate Professor Denzil Ferreira, leader of the Community Instrumentation and Awareness Research Group
Associate Professor Simo Hosio, leader of the Crowd Computing Research Group

UNIVERSITY OF COPENHAGEN
DEPARTMENT OF PUBLIC HEALTH

To The Novo Nordisk Foundation
The Data Science Investigator Committee

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

24. February 2021

Section of General Practice and
The Research Unit for General Practice
Department of Public Health
Faculty of Health and Medical Sciences
University of Copenhagen

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We strongly support the suggested project on "Digital Phenotyping" by professor Jakob E. Bardram. His research line and the proposed technology platform offer a promising significant impact on health data science in Denmark and possess strikingly benefits for public healthcare, society, and people living with chronic diseases. His focus on researching, designing, and implementing digital phenotyping technology will help build a strong capacity within education, research, and clinical trials in Denmark.

The Section of General Practice, Department of Public Health at the University of Copenhagen has been working with the research group of Jakob E. Bardram for the last three years in the "PhyPsy Trial" project funded by NNF. This project has focus on patients with severe mental illness (SMI) and their somatic co-morbidities. Currently, we are planning to use mHealth technology for digital phenotyping in our research. This kind of large-scale public health data science platform is essential in gaining a better understanding of these complex problems in the everyday lives of patients outside the clinic.

Looking ahead, we believe that digital phenotyping technology and its ability to collect ambulatory longitudinal data from patients in their everyday lives will play an increasing role in public health research and education.

Yours sincerely,

Susanne Reventlow
Professor, DMSc, MD, anthropologist
Head of Section of General Practice,
Department of Public Health, UCPH

REGION SJÆLLAND
– vi er til for dig

To The Novo Nordisk Foundation
The Data Science Investigator Committee

Dato: 03. marts 2021

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We strongly support the suggested project on "Digital Phenotyping" by professor Jakob E. Bardram. This line of research and the proposed technology platform offers a promise of significant impact on health data science in Denmark and possesses significant benefits for public healthcare, society and people living with chronic neurological diseases.

Its focus on researching, designing, and implementing digital phenotyping technology will help build a strong capacity in Denmark within both education, research, and clinical trials.

At the department of Neurology at, Zealand University Hospital we a strong interest in the cross-field between brain and technology, and have been involved in establishing CACHET.

We have successfully collaborated with the research group of Jakob E. Bardram for the past three years and have been researching a platform for digital phenotyping with a special focus on neurological diseases. As part of our collaboration, we have designed and implemented a core software domain model for data collection in digital phenotyping called the CACHET Research Platform (CARP).

CARP is a cores part of a recent application for a Clinical Academic Group (CAG) in the Greater Copenhagen in which we propose to further develop and use this platform for widespread research on the use of mobile and wearable devices (eDevices) for neurology.

We wish to continue this research collaboration as part of this project.

Looking ahead, we believe that digital phenotyping technology and its ability to collect ambulatory longitudinal data from patients in their

everyday lives will play an increasing role in neurology – both in terms of health research and for education.

Sincerely yours

Troels Wesenberg Kjær
Chief physician/Professor

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Journal no: [xxxx-xxxx]
Ref: [xxxxx]

Date: February 10, 2021

The Novo Nordisk Foundation
The Data Science Investigator Committee

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

We strongly support the suggested project on "Digital Phenotyping" by professor Jakob E. Bardram. This line of research and the proposed technology platform offer a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with mental disorders.

Its focus on researching, designing, and implementing digital phenotyping technology will help build a strong capacity in Denmark within both education, research, clinical trials, and industrial applications.

A core strategic research goal at the Copenhagen Center for Affective Disorders at Rigshopitalet is to investigate digital biomarkers for the diagnosis and treatment of mental disorders. We have a long-standing research collaboration with Jakob E. Bardram on this line of research and have published extensively on our shared results. We have recently released the Internet Cognitive Assessment Tool (ICAT) for supporting the screening and diagnosis of cognitive problems of patients with mental health problems, and we plan to continue the use of this technology in further clinical trials.

Looking ahead, digital phenotyping technology and its ability to collect ambulatory longitudinal data from patients' everyday behavior will play an increasing role in the diagnosis and treatment of mental health.

The ability of using a general-purpose platform for digital phenotyping is absolutely crucial in our line of research. This will help alleviate some of the basic technological and regulatory challenges related to data collection and management, and help us focus on clinical research rather than technology.

Kind regards,

Lars Vedel Kessing
Professor, MD, DMSc.

Kamilla Miskowiak
Professor, MSc DMSc.

Maria Faurholt-Jepsen
MD, DMSc.

Psychiatric Center Copenhagen
Department O, 6233, Rigshospitalet
University of Copenhagen

Steno Diabetes Center Copenhagen

To The Novo Nordisk Foundation
The Data Science Investigator Committee

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

We strongly support the suggested project on "Digital Phenotyping" by professor Jakob E. Bardram. This line of research and the proposed technology platform offers a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with chronic diseases.

Its focus on researching, designing, and implementing digital phenotyping technology will help build a strong capacity in Denmark within both education, research, clinical trials, and industrial applications.

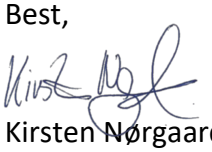
A core strategic research goal at Steno Diabetes Center Copenhagen (SDCC) is to develop treatment strategies including treatment with different technologies for all diabetes types to alleviate burden of diabetes and prevent late diabetes complications.

We have been working with the research group of Jakob E. Bardram for the last two years and have been using the technology for digital phenotyping in this research. DTU has, together with us, recently released the DiaFocus system for supporting the treatment of patients with type 2 diabetes, which is currently undergoing clinical trial at SDCC.

Looking ahead, digital phenotyping technology and its ability to collect ambulatory longitudinal data from continuous glucose monitoring (CGM) will play an increasing role in the treatment of diabetes.

The ability of using a general-purpose platform for digital phenotyping is absolutely crucial in our line of research. This will help alleviate some of the basic technological and regulatory challenges related to data collection and management and help us focus on clinical research rather than technology.

Best,



Kirsten Nørgaard
Professor in Clinical Diabetes Technology
Senior Consultant, MD, DMSc, MHPE
Head of Diabetes Technology Research

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Steno Diabetes Center Copenhagen
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REGION Mental Health Services

Child and Adolescent Mental Health Center

To The Novo Nordisk Foundation
The Data Science Investigator Committee

Date: 10 February 2021

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

We enthusiastically support the suggested project on "Digital Phenotyping" by Professor Jakob E. Bardram. This line of research and the proposed technology platform has the potential to make a significant impact on biomedical and health data science as well as lead to significant benefits for healthcare, individuals suffering from psychiatric symptoms and, in turn, society at large.

The project's focus on researching, designing, and implementing digital phenotyping technology will help build a strong capacity in Denmark within education, research, clinical trials, and industrial applications.

Core strategic research and clinical goals at the Child and Adolescent Mental Health Center include involving patients and families in their own treatment and recovery, offering high quality, safe, evidence-based treatments, and exploiting the latest technologies to optimize interventions. We have been working with the research group of Jakob E. Bardram for the last year and have been using the technology for digital phenotyping in the "Wrist Angel" project targeting children with obsessive compulsive disorder (OCD). This project is supported by the Novo Nordisk Foundation and the goal is to collect and extract digital biomarkers for OCD using machine learning models. We use the CACHET Research Platform (CARP) for digital phenotyping for Wrist Angel.

In the near future, we will extend this digital phenotyping technology and its ability to collect ambulatory longitudinal data with smartphones/ tablets and wearable biosensors that will enable us to design technologies for intervention and treatment of children with OCD. To achieve this, we need a technological platform with reusable components that can be used for such an application-specific implementation.

Thus, a general-purpose platform for digital phenotyping with reusable components is crucial for our research and our patients. CARP will alleviate some of the basic technological and regulatory challenges related to data collection and management and help us focus on clinical research rather than technology.

Sincerely,
The Wrist Angel project team

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Anne Katrine Pagsberg, M.D., Ph.D.
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Bispebjerg og Frederiksberg Hospital

Helena Domínguez,
Overlæge, ph.d.,
Lektor

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Att. The Novo Nordisk Foundation

The Data Science Investigator Committee

Date: 11.FEB.2021

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

Herewith I strongly support the suggested project on "Digital Phenotyping" by Professor Jakob E. Bardram. This line of research and the proposed technology platform offer a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with mental disorders.

A core strategic research goal at the Department of Cardiology in the Capital Region of Denmark is to provide health management tailored to patients needs.

We have a long-standing research collaboration with Jakob E. Bardram on this line of research. Over the past four years we have been working intensively on creating mobile health technology for heart rhythm disorders diagnosis and treatment in the REAFEL project funded by the Innovation Fund Denmark, that I chaired. Under Professor Jakob Bardram s lead, we have designed and released the mCardia system for collection of physiological (ECG), behavioral, and contextual data as part of this project. This system is unique worldwide and is only made possible due to the CARP platform.

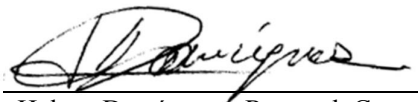
In my mind, digital phenotyping technology and its ability to collect ambulatory longitudinal data from patients' everyday behavior will in the future play a core role in ambulatory diagnosis and treatment of cardiological diseases.

../..

Our association is a symbiosis of powerful technology research that is iteratively tested and developed directly in a clinically relevant environment. We plan to continue the use of this technology in further clinical trials and we are actively seeking funding for such clinical research.

The ability of using a general-purpose platform like CARP for digital phenotyping is absolutely crucial in our line of research. We envisage that it will help alleviate some of the basic technological and regulatory challenges related to data collection and management and help us focus on clinical research rather than technology.

Best regards



Helena Domínguez, Research Consultant
Cardiology Department Y, BFH

To The Novo Nordisk Foundation
The Data Science Investigator Committee

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

With this letter, we strongly support the suggested project on "Digital Phenotyping" by professor Jakob E. Bardram. We believe that this line of research and the proposed technology platform offers a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with chronic diseases.

At Novo Nordisk, we have recently embarked upon a "Digital Health" strategy in which we explore opportunities to improve the lives of people with chronic diseases by providing connected devices and digital support tools.

The ability to conduct "digital phenotyping" studies are essential for us to better understand the free-living and everyday experience of people suffering from in particular type 2 diabetes and obesity. This may be a future substantial contributor to R&D of medical devices and digital solutions as well as in understanding how people live with type 2 diabetes and obesity.

We have been following the research of Jakob E. Bardram over the last years and would be interested in using this general-purpose platform for digital phenotyping with a special focus on type 2 diabetes and obesity. Novo Nordisk has a long-standing tradition of collaborating with DTU and this would fit into this alliance. In alignment with professor Jakob E. Bardrams ambitions, we hope to leverage the collaboration with him and other partners to establish joint PhD projects aiming at increasing knowledge about how digital phenotyping can be used to improve lives of people type 2 diabetes and obesity.

Looking ahead, we firmly believe that digital phenotyping technology and its ability to collect ambulatory longitudinal data from patients and caregivers "in-the-wild" will play an increasing role in biomedical science, medical device and digital health R&D, and pharmaceutical product development.

Kind Regards

Morten Lind Jensen, MD, PhD, DPM. Senior Director, Medical & Science Devices & Digital Health

MNLJ Digitally signed by MNLJ Date: 2021.02.25 10:18:56 +01'00'

Daniél Vega Møller, MD, PhD. Vice President, Medical & Science, Obesity and Metabolism

Novo Nordisk A/S
Medical & Science, Devices & Digital Health

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The Novo Nordisk Foundation
att. Data Science Investigator Committee

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

We support the suggested project on "Digital Phenotyping" by professor Jakob E. Bardram. This line of research and the proposed technology platform offers a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with chronic diseases.

Its focus on researching, designing, and implementing digital phenotyping technology will help build a strong capacity in Denmark within clinical trials and industrial research and development (R&D).

A core strategic research goal at Cortrium is to provide the healthcare sector with smart wearables sensors for ECG monitoring. Research in Digital Phenotyping can help Cortrium to understand these technologies better.

We have been working with the research group of Jakob E. Bardram for the last three years and have been researching the technology for digital phenotyping for cardiovascular diseases (CVD). As part of our collaboration, DTU have recently released the mCardia system for supporting the diagnosis and treatment of patients with CVD which has also been put into clinical trials. We wish to continue this research collaboration as part of this project.

Looking ahead, we believe that digital phenotyping technology and its ability to collect ambulatory longitudinal data from our C3 ECG devices will play an increasing role in the diagnosis and treatment of CVD.

The technological research into how a platform for digital phenotyping is to be designed is important to our R&D. This will help alleviate some of the basic technological challenges related to data collection and management, and help us focus on application-specific R&D for the benefit for our clinical partners and ultimately for patients with CVD.

Best wishes,

Jacob Eric Nielsen
Co-founder & QA-manager
Cortrium

oticon MEDICAL | Because sound matters

To

The Novo Nordisk Foundation
The Data Science Investigator Committee

18-02-2021

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

With this letter, we strongly support the suggested project on "Digital Phenotyping" by professor Jakob E. Bardram. This line of research and the proposed technology platform offers a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with hearing loss.

The core strategic research goal at Oticon is to gather insight that can lead to the development of hearing solutions that provide audiological and cognitive benefits *in real-life.* Ecological validity, as it is often referred to in the hearing research community, is truly lacking in hearing science as illustrated by the many hearing device users who demonstrate strong benefits from their device when tested in a laboratory setting but yet still struggle significantly in real-life scenarios. Digital phenotyping in the wild is a necessary step in understanding why real-life is such a challenge and harness that understanding to build tomorrow hearing solutions.

We have been following the research of Jakob E. Bardram over the last years and would be highly interested in using this general-purpose platform for digital phenotyping with a special focus on hearing diseases. Oticon has a long-standing tradition of collaborating with DTU and this would fit into this strategic alliance. Our experience in analyzing data from hearing devices with the volatile environment and constant adaption to the intent of the wearer also enables Oticon to offer significant and unique contributions into the further development of methods for digital phenotyping in areas outside hearing.

Looking ahead, we firmly believe that digital phenotyping technology and its ability to collect ambulatory longitudinal data from different devices "in-the-wild" will play an increasing role in hearing loss research and hence for our customers.

The technological research into how a platform for digital phenotyping is to be designed is absolutely crucial to our R&D. This will help alleviate some of the basic technological challenges related to data collection and management, and help us focus on application-specific R&D for the benefit for our clinical partners and to grow our business.

Best,

Kind Regards,

Søren Riis, Chief Research Officer
Oticon Medical

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To
The Novo Nordisk Foundation
The Data Science Investigator Committee

Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

We strongly support the suggested project on "Digital Phenotyping" by professor Jakob E. Bardram. This line of research and the proposed technology platform offers a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with chronic diseases.

Its focus on researching, designing, and implementing digital phenotyping technology will help build a strong capacity in Denmark within clinical trials and industrial research and development (R&D).

We have been working with the research group of Jakob E. Bardram for the last three years and have been researching a platform for digital phenotyping with a special focus on neurological diseases. As part of our collaboration, DTU and iMotions have designed and implemented a core software domain model for data collection in digital phenotyping. This domain model has been released as open source and is now maintained and used by both of us for the iMotions Biometric Healthcare Research Platform (BHRP) and for the CACHET Research Platform (CARP), respectively.

We wish to continue this research collaboration as part of this project.

Looking ahead, we firmly believe that digital phenotyping technology and its ability to collect ambulatory longitudinal data from different devices "in-the-wild" will play an increasing role in biometric research and hence for our customers.

The technological research into how a platform for digital phenotyping is to be designed is absolutely crucial to our R&D. This will help alleviate some of the basic technological challenges related to data collection and management, and help us focus on application-specific R&D for the benefit for our clinical partners and to grow our business.

Best,

Thorsten Larsen-Seul
COO
iMotions A/S

Studies&Me

Personalizing treatment development

To
The Novo Nordisk Foundation
The Data Science Investigator Committee,

February 18, 2021

Studies&Me A/S
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Letter of Support for the Data Science Investigator Application on "Digital Phenotyping"

We strongly support the suggested project on "Digital Phenotyping" by professor Jakob E. Bardram. This line of research and the proposed technology platform offers a promise of significant impact on biomedical and health data science while also possesses significant benefits for healthcare, society and people living with chronic diseases.

Its focus on researching, designing, and implementing digital phenotyping technology will help build a strong capacity in Denmark within clinical trials and industrial research and development (R&D).

A core strategic research goal at Studies&Me is to ensure digitization of clinical trials, hence, to utilize the data and technologies that public available digital tools enable so that trial participants and healthcare providers are empowered to better understand disease pattern in a trial setting.

We have been following the research done in the group of Jakob E. Bardram for several years and can see that this may supplement nicely to our technological strategy. Looking ahead, we believe that digital phenotyping technology and its ability to collect ambulatory longitudinal data from the patient's own devices and more application-specific configurations will play an increasing role in the future of life science research utilizing virtual trials. We wish to participate in this research agenda as part of this project.

The technological research into how a platform for digital phenotyping is to be designed may be crucial to be implemented in our platform. This may help alleviate some of the basic technological challenges related to data collection and management and help us focus on application-specific activities for the benefit for our clinical and industrial partners and ultimately for patients.

Should you have any questions or if you need to confirm this letter please do not hesitate to contact me directly at john@studiesandme.com.

Yours sincerely,

John Robert Zibert
CEO
Studies&Me A/S