# 4ᵗʰ Signal Processing and Monitoring (SPaM) in Labour Workshop

## Munich, Germany

### 7-9 July 2022

## THURSDAY (7ᵀᴴ JULY)

**7:30 – 9:00 COMPULSORY COVID TESTS**

**8:00 REGISTRATION & COFFEE**

**8:45 – 9:00 WELCOME FROM THE ORGANISERS**

**9:00 – 10:25 RISK ASSESSMENT WITH FETAL HEART RATE MONITORING 1**

**9:00 – 9:35 Rik Vullings, Eindhoven University of Technology, The Netherlands**
Predicting the fetal condition with a virtual, AI-based expert obstetrician

**9:35 – 10:05 Malin Hozlmann, Karolinska Institutet, Sweden**
TBC

**10:05 – 10:25 Aimee Lovers, University of Oxford (former student), UK**
Cardiotocography and clinical risk factors in early term labour: a retrospective cohort study using computerised analysis with Oxford System

**10:25 – 10:45 INTRODUCTION SESSION FOR YOUNG RESEARCHERS**

**10:25 – 10:30 Camilla Juel**, **Denmark**

**10:30 – 10:35 Farah Francis, Edinburgh University, UK**

**10:35 – 10:40 Inma Mejía, Madrid, Spain**

**10:40 – 10:45 Gabriel Jones, University of Oxford, UK**

**10:45 – 11:15 COFFEE BREAK**

**11:15 – 12:30 COMPUTERIZED INTRAPARTUM MONITORING**

**11:15 – 11:45 Martin Daumer, Technical University of Munich & TRIUM, Germany**
Computerized fetal labour monitoring (CTG) analysis in Munich: past, present & future

**11:45 – 12:15 Mariana Tome, University of Oxford, UK**
Fit for labour: a screening test at the onset of labour

**12:15 – 12:30 BEN M'BAREK & Gregoire JAUVION, Paris, France**
Introducing genos.care website and plans

**12:30 – 13:30 LUNCH**

**13:30 – 14:50 FETAL MONITORING TECHNOLOGIES**

**13:30 – 13:50 Rene Kok, Nemo Healthcare, The Netherlands**
Current status of and future possibilities for non-invasive fetal (and maternal) monitoring devices of Nemo Healthcare

**13:50 – 14:00 Arnaldo Batista, Universidade Nova de Lisboa, Portugal**
Alvarez and Braxton-Hicks Waves in the Electrohysterogram: An Input for Pregnancy Monitoring

**14:00 – 14:10 Giulia Baldazzi, University of Cagliari, Italy**

Fetal ECG extraction from non-invasive multichannel recordings by nonlocal median and optimal shrinkage

**14:10 – 14:20 Julian Penders, Bloomlife**

Introducing *Bloomlife*: vision and research work

**14:20 – 14:30 Mats Kjellstrand, Neoventa, Sweden**

Updates from Neoventa

**14:30 – 14:50 Stephen Gilbert, Technische Universität Dresden, Germany**

Benefit/Risk Analysis of medical devices - some thoughts on comparing apples and oranges

## 14:50 – 15:20 COFFEE BREAK

## 15:20 – 15:45 MECHANISMS OF PERINATAL INJURY: THE BIG UNKNOWNS

**Austin Ugwumadu & Antoniya Georgieva**

A new initiative: alternative and non-hypoxia pathways to fetal injury around labour/delivery

## 17:00 -19:00 SOCIAL PROGRAM: GUIDED WALKING TOUR OF MUNICH OLD TOWN (START FROM)

Starting point: The National Theatre (main entrance) on Max-Joseph-Platz

## FRIDAY (8TH JULY)

## 7:30 – 9:00 COMPULSORY COVID TESTS

## 9:00 – 10:30 DEEP LEARNING FOR INTRAPARTUM FETAL MONITORING 1

**9:00 – 9:10 Philip Warrick, Perigen and McGill University, Canada**

Introduction to next 2 talks: lessons learned and preliminary results

**9:10 – 9:30 Johann Vargas, McGill University, Canada**

Assessment of time-varying fetal heart rate signals when the time before delivery is unknown

**9:30 – 9:50 Derek Kweku DEGBEDZUI, McGill University, Canada**

Applying deep learning to electronic fetal monitor (EFM) signals for the early detection of intrapartum hypoxic-ischemic encephalopathy (HIE)

**9:50 – 10:10 Daniel Asfaw, Portsmouth University & Oxford University**

Deep Learning models to predict fetal compromise from the initial CTG trace

**10:10 – 10:30 Maria Signorini & Giovanni Magenes, Politecnico di Milano, Italy**

Fetal heart rate analysis of 30,000 traces with the ML and Deep Learning approach to classification

## 10:30– 11:00 COFFEE BREAK

## 11:00 – 12:30 LABOUR MONITORING AND THE HUMAN FACTORS

**11:00 – 11:20 Rachel Plachcinski, Public and Patient Representative, UK**

Voice from the public in the UK: what do women want

**11:20 – 11:40 Catherine Hopley, UK**

Fetal Monitoring in the UK – recent progress and initiatives, ongoing developments and outlook

**11:40 – 12:00 Rene Kok, Nemo Healthcare, The Netherlands**

Challenges and lessons from implementing change in delivery wards

**12:00 – 12:30 Clinical Panel Discussion**

Hopley, Plachcinski, Kok, Tome, Ugwumadu, Holzman, Hruban, Heiselman

**12:30 – 13:40 LUNCH**

**13:40 – 15:00 FETAL MONITORING BIG DATA**

**13:40 – 14:00 Martin Daumer & Antoniya Georgieva**

Big CTG data initiative: idea to establish an (European/Intl.) independent CTG trials, research and resource centre

**14:00 – 15:00 Panel Discussion**

Boudet, Warrick, Georgieva, Signorini, Holzman, Abry

**15:00 – 15:30 COFFEE BREAK**

**15:30 – 16:30 DEEP LEARNING FOR INTRAPARTUM FETAL MONITORING 2**

**15:30 – 15:50 Petar Djuric, Stony Brook University, USA**

Monitoring the well-being of fetuses during labor by deep Gaussian processes

**15:50 – 16:10 Samuel Boudet, Catholic University of Lille, France**

Automatic detection of Maternal Heart Rate and false signals on Fetal Heart Rate signal by deep learning

**16:10 – 16:30 Group Discussion on all talks re Deep Learning**

**16:30 – 17:10 LOW RESOURCE SETTINGS & CONTINUOUS MONITORING**

**16:30 – 16:50 Solveig Haukås Haaland, Laerdal, Norway**

Collecting data on the day of birth

**16:50 – 17:10 Nicolò Pini, Columbia University, USA**

The role of remote fetal monitoring in low-income settings, lessons learned from a study in South Africa

**19:00 – 22:00 NETWORKING DINNER: SCHLOSS NYMPHENBURG**

**SATURDAY (9TH JULY)**

**7:30 – 9:00 COMPULSORY COVID TESTS**

**9:00 – 10:00 RISK ASSESSMENT WITH FETAL HEART RATE MONITORING 2**

**9:00 – 9:30 Patrice Abry, ENS Lyon, France**

Relations between FHR dynamics and gas blood contents

**9:30 – 9:45 Moira Barbieri, Università degli Studi di Milano, Italy**
Relationship Between Deceleration Morphology and Phase Rectified Signal Averaging-Based
Parameters During Labor

**9:45 – 10:00 Bester Maretha, Eindhoven University, The Netherlands**
Maternal heart rate variability: a potential tool for the early detection of pregnancy
complications

**10:00 – 10:30 COFFEE BREAK**

**10:30 – 11:00 HOME MONITORING PERSPECTIVES**

**Antoniya Georgieva & Martin Daumer**

**11:00 – 12:00 WHOLE WORKSHOP DISCUSSION**

**12:00 FINAL REMARKS AND GOOD-BYE**


**DETAILS FOR PANEL DISCUSSIONS**


**LABOUR MONITORING AND THE HUMAN FACTORS**

**Question to Panel:**

- What is your role and experience
- How we integrate new technology in delivery wards in the context of human factors?
- List the main 'human factors' challenges you see with working in delivery ward, focusing on those relevant to continuous fetal monitoring / risk assessment
- What are potential ways forward in particular involving technology
- If you had a magic wand (lots of money and lots of influence), what would you think is a good bold strategy to improve the situation

**Moderator:** Georgieva

**Panellists:** Hopley, Plachcinski, Kok, Tome, Ugwumadu, Holzman, Hruban, Heiselman


**FETAL MONITORING BIG DATA**

**Question to Panel:**

- What data do you have or expect to have
- List the main challenges you see with harnessing the data
- What are potential ways forward
- If you had a magic wand (lots of money and lots of influence), what would you think is a good bold strategy

**Moderator:** Daumer

**Panellists:** Boudet, Warrick, Georgieva, Signorini, Holzman, Abry