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FemTech and AI for Women's Health

From reactive treatment to preventive medicine

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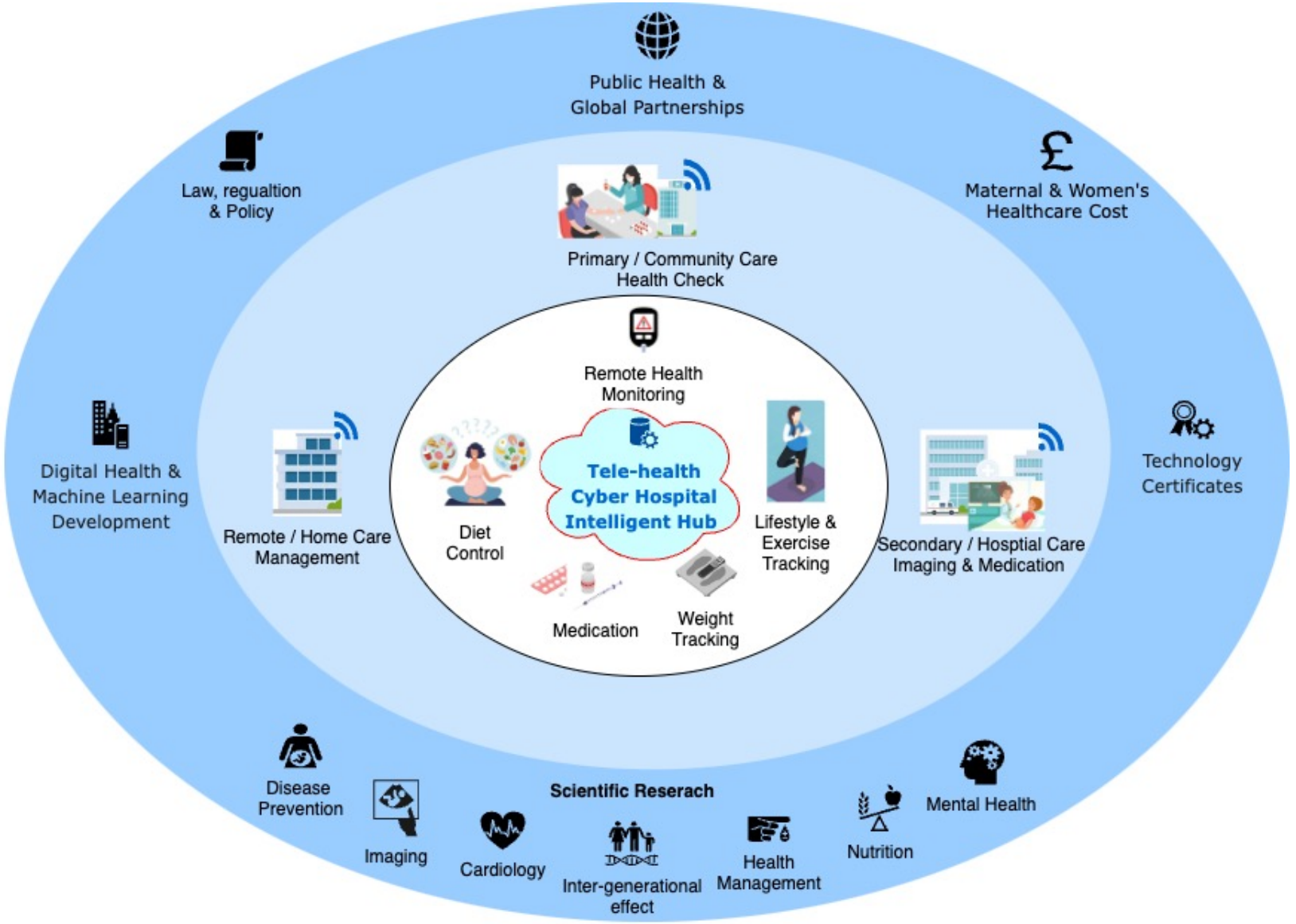
ROYAL ACADEMY OF ENGINEERING

FemTech and Women's Health Eco Systems



FemTech and Women’s Health in Needs

Ideas
Innovations
Business
Canvas

1. Chronic non-communicable diseases and early detection
2. Reproductive health and infertility care
3. Pregnancy care and maternal health
4. Cancers: diagnosis, treatment, and aftercare
5. Menopause and age-related conditions
6. Sexual health and reproductive rights
7. Gynecologic care and surgery
8. Wellbeing health: ageing, mental health, sleep, sports sciences
9. Gender-based and personalized medicine
10. Women's health equality and public health strategies

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Case Study One: Gestational Diabetes Monitoring: GDm-Health

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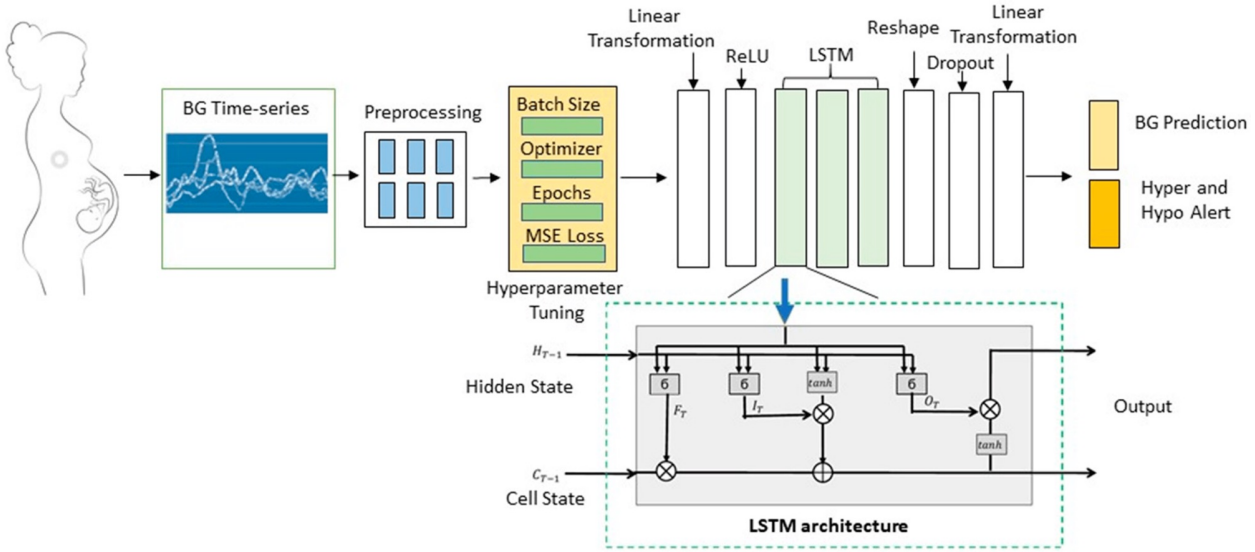

Figure. Architecture of three-layer stacked-LSTM and its model development pipeline.

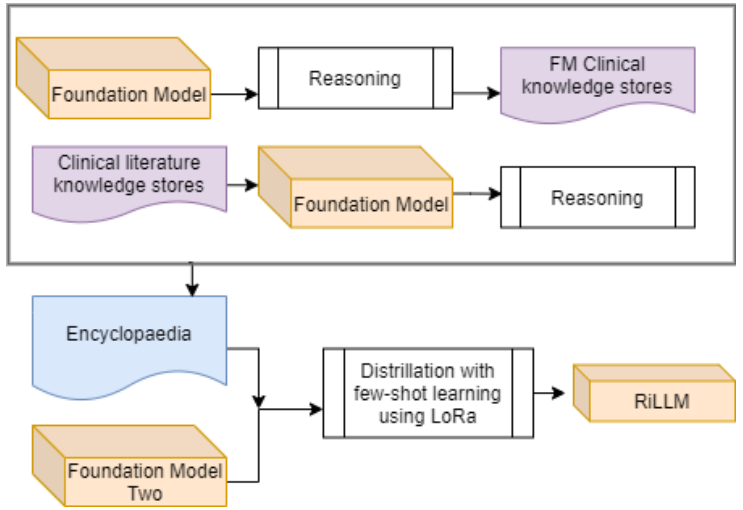

Table. Performance comparisons on GDm-Health and CGM-based LSTM models.

Study	Rabby *et al.* [1]	Wang *et al.* [2]	Doorn *et al.* [3]	Pustozerov *et al.* [4]	This paper [5]
Monitoring Method	CGM	CGM	CGM	CGM	Fingerstick
Patient size for modelling / Diabetes Type	6 / T1DM	56 / T1DM	540 / mixed of normal glucose metabolism, prediabetes, and T2DM	62 / mixed of 48 GDM and 14 normal glucose tolerance	943 / GDM
Patient size for testing / Diabetes Type	No independent testing	No independent testing	6 / T1DM	No independent testing	105 / GDM
Prediction Model	Three-layer Stacked-LSTM	(1) LSTM (2) VMD-LSTM (3) PSO-LSTM (4) VME-PSO-LSTM	LSTM	Linear regression with Lasso regularization	Three-layer Stacked-LSTM
Observation Window	Up to 8 weeks	125 hours	≥ 48 hours	7 days	7 days
Prediction Window	Dynamic One-hour	Dynamic One-hour	Dynamic One-hour	One-hour after meal: next day	One-hour before or after meals **
Accuracy* (RMSE in mmol/L)	0.958	(1) 1.182 (2) 0.507 (3) 0.385 (4) 0.246	1.730	0.870	(1) After meal: **0.911** (2) Before meal: **0.760**

* Accuracy reported on the test set unless there are no test set results

** After meal is the mean of AB, AL, and AD, and before meal is the mean of BB, BL, and BD, result reported for the overall cohort model performance for 7 predicted 14-day windows.

Nature *npj* Women's Health

Collection
Submission status: Open
Deadline: 30 September 2024

The influence of sex and gender on chronic disease

This Collection invites research on the impact of sex and gender on chronic diseases, including but not limited to: cardiovascular, neurological, and metabolic diseases.

Arvin Forghanian-Arani & Daniela Hurtado Andrade

Collection
Submission status: Open
Deadline: 02 November 2024

Advances in AI for women's health, reproductive health, and maternal care: bridging innovation and healthcare

This Collection features original research, comments and perspectives that provide key insights into addressing challenges related to AI for women's health, reproductive health, and maternal care.

Melissa Medvedev, MD, PhD & Huiqi Yvonne Lu, PhD

Collection
Submission status: Open
Deadline: 10 January 2025

Inflammatory disorders and women's reproductive health

This Collection invites original research, reviews, and comments on the role of inflammation on women's reproductive health and health outcomes, and well-being.

Linda C. Giudice, MD, PhD, Marina Sirota, PhD & Stacey A. Missmer, SM, ScD

Collection
Submission status: Open

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npj Women's Health **2**, Article number: 28 (2024) | Cite this article

Cookies | University Hospitals Birmingham NHS Foundation Trust

AI Regulation – what it means for industries

Unacceptable-risk AI systems	High-risk AI systems	Limited- and minimal-risk AI systems
• Subliminal, manipulative, or exploitative techniques causing harm • Real-time, remote biometric identification systems used in public spaces for law enforcement • All forms of social scoring	• Systems that evaluate consumer creditworthiness • Recruiting or employee-management systems • Systems utilizing biometric identification in nonpublic spaces • Safety-critical systems (eg, systems that would put the health of citizens at risk due to failure) • Any systems used in the administration of justice	• AI chatbots • AI-enabled video and computer games • Spam filters • Inventory-management systems • Customer- and market-segmentation systems • Most other AI systems