**Project Proposal**

**NHS Fellowship in Clinical Artificial intelligence**

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| **Project title:** |  |
| **Project region code** | **Faculty use only** |
| **Project sponsor code** | **Faculty use only** |
| **NHS Trust/Site** |  |
| **Supervisor name** |  |
| **Supervisor email** |  |
| **Supervisor biography** |  |
| **Multidisciplinary team description** | *Key team members in contact with fellow: names and roles. Use placeholder roles if named team member not yet assigned.*      *Which senior team members are the point of contact for direct supervision (guideline: 1hr/wk)?*      *Typical weekly schedule of meetings*      *Physical co-working spaces* |
| **Start date** | Default: August 2025 |
| **Duration** | Default: 12mo |
| **Estimated workload** | Default: 0.4FTE (2 days per week), unbanded |
| **Capacity for fellows (at least 1)** |  |

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| 1. **Introduction**   *Projects may evolve over the course of the fellowship year- the proposal is a roadmap.* |
| *Summary of the project and relevance to Clinical AI:*      *Clinical AI life cycle stages involved: tick all that apply*  Design: *defining objectives and model architecture*  Data procurement and wrangling: *collecting, cleaning, and preparing data*  Building: *developing and training the AI model*  Testing and validation: *ensuring AI model performance and effectiveness*  Deployment (**Essential**): *integrating the AI system into workflows (shadow deployments count)*  Monitoring: *tracking performance and ensuring compliance*  Business and use-case development: *health economics etc.* |
| 1. **Educational aims**   *What learning objectives of the Clinical AI Curriculum are met by this project?*  *Tick all that apply- you may annotate to explain specifically how it relates to this project* |
| *Artificial Intelligence fundamentals*  Understand and apply different types of AI algorithms for different tasks (e.g. logistic regression, decision trees, support vector machines, random forest, K-means clustering, neural networks, Bayesian approaches)  Understand data provenance, quality and structure requirements for training AI algorithms, such as synthetic data, metadata, taxonomies, ontologies, and standards  Perform data extraction and wrangling (e.g. feature labelling/extraction, dimensionality reduction, normalisation)  Understand types of training for AI algorithms (e.g. supervised, unsupervised, reinforcement, ensemble, distributed, and federated learning)  Understand types of languages and frameworks used for the creation and analysis of AI algorithms *(*e.g. Python, R, SQL)  Understand and apply AI algorithm training and optimisation (e.g. tuning hyper parameters, internal validation, optimal stopping)  Understand and apply common metrics for AI algorithm performance (e.g. precision, recall, F1 score, Receiver Operator Characteristic)  Understand AI algorithm validation methods (e.g. hold out method, cross validation)  *Regulation and standards:*  Understand CE/UKCA marking and methods for obtaining certification for different classes of medical device for AI technology  Understand and apply GDPR to AI technology  Understand and apply NHS Digital’s Clinical Risk Management standards to AI technology (i.e. DCB0129, DCB0160)  Understand and apply HRA definitions of clinical research and service evaluation as they relate to AI evaluation and implementation, following the appropriate governance for each  Understand legal frameworks applying to the use of AI technology in clinical decision making. (e.g. negligence, product liability, consent)  *Validation and evaluation*  Critically appraise the published literature relating to AI algorithms, using established evidence standards where appropriate (e.g. NICE evidence standards framework)  Understand the process of local AI model validation, including prospective clinical studies (e.g. SPIRIT-AI, CONSORT-AI guidelines)  Establish and manage post-deployment monitoring, evaluation, and iteration of AI technology, including processes for detecting, reporting, and managing adverse effects or serious incidents related to AI  Understand, measure, and mitigate potential sources of error and bias in AI algorithms, including circumstances leading to inequitable distributions of patient outcomes (e.g. medical algorithmic audit methodology)  *Integration and systems impact*  Integrate AI technology with existing healthcare IT systems  Design and re-design clinical workflows to integrate AI technology, applying principles such as interoperability and user-centred design  Evaluate the impact of AI technology in health economic measures, service efficiency, patient outcomes, workforce, and environment  Understand how user interactions with AI technology may be affected by human cognitive biases (e.g. automation bias, aversion bias, confirmation bias, rejection bias, and alert fatigue)  Understand AI failure modes and how these differ from human errors in clinical reasoning and decision making (e.g. outlier detection, adversarial attacks), and how to respond in such circumstances  Understand the principles and limitations of AI explainability  Understand the principles and guidelines for AI technology procurement in healthcare  *Strategy and culture:*  Participate in and develop multi-disciplinary teams for the creation and deployment of AI technology  Collaborate effectively with colleagues in academia and industry  Understand and apply the principles digital transformation and effective change management  Establish leadership buy-in and support internal champions for change for AI technology  Understand the learning and development needs of NHS staff for AI technology  Understand the needs and expectations of patients and public for the ethical and accessible use of AI through the principles of co-design |
| 1. **Roles, responsibilities, and resources**   *Fellows in Clinical AI are recruited from the following clinical workforce groups: doctors and dentists in training programmes leading to CCT; AHPs, nurses & midwives, pharmacy professionals band 7-8b.*  *Projects should be open to all workforce groups by default, but can have Desirable additional skills, knowledge, or background. Please discuss with the faculty directly if you intend to add further Essential requirements.* |
| *Roles and responsibilities of the fellow*      *Desirable prerequisite skills, knowledge, or background*      *Anticipated opportunities for presentation and publication*      *Resources required for the fellow to successfully complete this project (e.g. hardware, software, desk space, site access, Letter of Access or Honorary Contract, local induction).* ***It is the Supervisor’s responsibility to arrange these resources.*** |
| 1. **Milestones and deliverables**   *Where possible, these should be Specific, Measurable, Achievable, Relevant and Time-bound.*  *Avoid concentration of major project activity within last quarter.* |
| Milestones: 0-3mo      Milestones: 4-6mo      Milestones: 7-9mo      Milestones: 10-12mo |
| 1. **Challenges and mitigations** |
| *What challenges might disrupt this project or cause delays (e.g. foreseeable external dependencies)?*  *For each challenge identify suitable mitigations*      *What useful work can the fellow contribute to other clinical AI activity in your team, in the event of unforeseen delays and to supplement their experience on their primary project?* |
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1. **Potential hazards**

Identify factors that could cause harm (hazards), and the likelihood that this will occur (risk- high/low).

Then identify what measures will be taken to mitigate this.

You may add new lines for other themes not explicitly listed in this table.

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| **Theme** | **Relevant to project?** | | **Hazard**  (potential cause of harm) | **Risk**  (likelihood of the harm occurring) | **Mitigations** |
| No (go to next row) | Yes (describe→) |
| Effect on live clinical workflows |  |  |  |  |  |
| Governance of confidential data |  |  |  |  |  |
| Legal and ethical standards |  |  |  |  |  |
| Working out of hours or in isolation |  |  |  |  |  |
| Equipment |  |  |  |  |  |
| Other hazards identified |  |  |  |  |  |

**Quality assurance checklist (faculty use only)**

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| **Criterion** | **Description** | **Faculty log** |
| Subject area (Project title, Introduction) | This project’s subject is a relevant application of artificial intelligence in clinical workflows and involves Deployment. | Date: |
| Passed |
| Notes: |
| Supervisor and team (Supervisor, Key team members) | The credentials of the supervisor and the skill-mix and supervision capacity of the broader team appear suitable for a fellow to have a productive and immersive multi-disciplinary experience. | Date: |
| Passed |
| Notes: |
| Educational aims | The stated educational aims align with at least 3 the following themes:  Regulation & standards  Validation & evaluation  Integration & systems impact  Strategy & culture | Date: |
| Passed |
| Notes: |
| Roles, responsibilities, and resources | The roles and responsibilities expected of the fellow are an appropriate match to the educational aims.  Pure data-labelling or annotation is not a suitable role.  There are adequate resources described to support the fellow in their project. | Date: |
| Passed |
| Notes: |
| Milestones and deliverables | Milestones appear SMART, and the provisional timeline would allow delivery of the educational aims above, even with some delays *(importantly- not all major project activity is concentrated within last quarter)* | Date: |
| Passed |
| Notes: |
| Risk mitigation (Challenges and mitigations, Potential hazards) | Anticipated challenges and hazards are appropriately identified.  Reasonable mitigations are described.  There is parallel clinical AI activity described in the team which would enrich the experience of the fellow and mitigate in cases of delays to primary project. | Date: |
| Passed |
| Notes: |