**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 |

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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 (for example, 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* * *Perform data extraction and wrangling (for example, feature labelling/extraction, dimensionality reduction, normalisation)* * *Understand types of training for AI algorithms (for example, supervised, unsupervised, reinforcement learning, ensemble learning, distributed learning)* * *Code using languages and frameworks used for the creation and analysis of AI algorithms (for example, Python, R, SQL)* * *Understand and apply AI algorithm training and optimisation (for example, tuning hyper parameters, internal validation, optimal stopping)* * *Understand and apply common metrics for AI algorithm performance (for example, precision, recall, F1 score, Receiver Operator Characteristic analysis)* * *Understand AI algorithm validation methods (for example, 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 software* * *Understand and apply GDPR to AI software* * *Understand and apply NHS Digital’s Clinical Risk Management standards to AI software (for example, 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 software in clinical decision making. E.g. negligence, product liability*   *Validation and evaluation*   * *Critically appraise the published literature relating to AI algorithms, using established evidence standards where appropriate (for example, NICE evidence standards framework)* * *Understand the process of local model validation, including prospective clinical studies of AI software* * *Understand and apply the principles of medical algorithmic audit* * *Establish and manage post-deployment monitoring, evaluation, and iteration of AI software, 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*   *Integration and systems impact*   * *Integrate AI software with existing healthcare IT systems* * *Design and re-design clinical workflows to integrate AI software* * *Evaluate the impact of AI software in health economic measures, service efficiency, patient outcomes, and workforce* * *Understand how user interactions with AI software may be affected by human cognitive biases (for example 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 (for example outlier detection)* * *Understand the principles and limitations of AI explainability*   *Strategy and culture:*   * *Participate in and develop multi-disciplinary teams for the creation and deployment of AI software* * *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 software* * *Understand the learning and development needs of NHS staff for AI software* |
| 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**   *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 mitigations as sub-bullets*   * Challenge 1   + Mitigation 1   *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:  AI regulation and standards  AI validation and evaluation  AI integration and systems impact  AI strategy and 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: |