**Dissertation Work Plan: Deepfake Detection using Time Series and Video Masked Autoencoders (16 Weeks)**

This table outlines the planned stages and deliverables for your dissertation project on Deepfake Detection using Time Series and Video Masked Autoencoders. The final submission date is September 6th, 2024.

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| --- | --- | --- | --- | --- |
| Serial Number | Task/Phase | Start Date - End Date | Duration (Weeks) | Deliverables |
| 1 | **Literature Review** | June 10th - July 5th | 4 | - Comprehensive review of deepfake detection techniques, including existing applications of Masked Autoencoders (MAE) for anomaly detection. <br> - Identification of research gaps and opportunities for applying Time Series and VideoMAE for deepfake detection. <br> - Annotated bibliography of relevant research papers. |
| 2 | **Dataset Collection and Analysis** | July 8th - July 19th | 2 | - Identify and acquire publicly available datasets containing real and deepfake videos (e.g., Deepfake Detection Challenge dataset). <br> - Explore and analyze the datasets, including data quality assessment, feature extraction for time series data (X,Y coordinates), and pre-processing steps for video data. <br> - Documented data exploration and analysis report. |
| 3 | **Evaluation of Existing Deepfake Detection Models** | July 22nd - August 2nd | 2 | - Implement and evaluate existing deepfake detection models (e.g., Xception, MesoNet) on the acquired datasets. <br> - Compare and analyze the performance metrics (e.g., accuracy, precision, recall) of these models. <br> - Report on the evaluation of existing deepfake detection models. |
| 4 | **Deepfake Creation: Video and Time Series Data** | August 5th - August 16th | 2 | - Implement deepfake creation techniques: <br> \* Video: Utilize existing deepfake creation tools (e.g., DeepFaceLab) to create deepfakes from real video data. <br> \* Time Series Data: Explore techniques to manipulate time series data (e.g., introducing artificial noise, altering trends) to create synthetic deepfakes. <br> - Documented methodology and examples of generated deepfakes (video and time series). |
| 5 | **Comparative Study: VideoMAE vs. Time SeriesMAE** | August 19th - August 30th | 2 | - Design and implement Time Series Masked Autoencoder (TSMAE) and Video Masked Autoencoder (VideoMAE) architectures for deepfake detection. <br> - Train both models on the prepared datasets (real and deepfake videos/time series). <br> - Conduct a comparative study to evaluate the performance of TSMAE and VideoMAE in detecting video and time series deepfakes. <br> - Report on the comparative study, including performance metrics and analysis. |
| 6 | **Evaluation and Detection System** | September 2nd - September 5th | 1 | - Develop a deepfake detection system based on the best performing model (TSMAE or VideoMAE, or potentially an ensemble). <br> - Evaluate the developed system's performance on unseen deepfake videos and time series data. <br> - Documented deepfake detection system and its evaluation results. |
| 7 | **Thesis Writing and Refinement** | Throughout the Project | Ongoing | - Draft thesis chapters based on the completed tasks and findings. <br> - Incorporate feedback from supervisor and refine the thesis for clarity and coherence. <br> - Finalized dissertation document. |

**Additional Notes:**

* This plan allows flexibility for adjustments based on your progress.
* Consider including a feasibility study within the literature review to assess the viability of your proposed approach.
* Explore ethical considerations of deepfake technology during the research process.
* Allocate time for contingency plans in case of unforeseen challenges.
* Schedule regular meetings with your dissertation supervisor for guidance and feedback.

This plan provides a structured framework for your dissertation project. Remember to adapt it as needed to ensure a successful and impactful research endeavor.

**Dissertation Work Plan: Deepfake Detection using Time Series and Video Masked Autoencoders (16 Weeks)**

This table outlines the planned stages and key deliverables for your dissertation project on Deepfake Detection using Time Series and Video Masked Autoencoders. The final submission date is September 6th, 2024.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Serial Number | Task/Phase | Start Date - End Date | Duration (Weeks) | Key Deliverables |
| 1 | **Literature Review** | June 8th - June 21st | 2 | - Annotated bibliography of relevant research papers Video generation using MAE and Deepfake techniques related to handwriting/ signatures. |
| 2 | **Dataset Collection and Analysis** | June 22nd - June 28th | 1 | - Acquired video datasets for handwriting and signature. Summary report on data exploration and pre-processing steps. |
| 3 | **Evaluation of Existing Video generation Models** | June 29th - July 12th | 2 | Evaluation report of different models in this area. |
| 4 | **Deepfake Generation: Handwriting generation Using VideoMAE** | July 13th - July 26th | 2 | - Documented methodology for deepfake handwriting creation from videos using VideoMAE. |
| 5 | **Deepfake Generation: Handwriting generation Using TrajectoryMAE** | July 27th - August 16th | 3 | - Documented methodology for deepfake handwriting creation from 1-D Data (X-Y trajectory co-ordinates) |
| 5 | **Comparative Study: VideoMAE vs. TrajectoryMAE** | August 17th - August 23rd | 1 | - Report on the comparative performance of TMAE and VideoMAE for deepfake generation. |
| 6 | **Deepfake Detection System** | August 24th - September 6th | 2 | - Documented deepfake detection system based on the best performing model. Evaluation report on the system's performance. |
| 7 | **Thesis Writing and Refinement** | Throughout the Project | Ongoing | - Finalized dissertation document. |

**Additional Notes:**

* This plan allows flexibility for adjustments based on your progress.
* Consider including a brief feasibility study within the literature review.
* Address ethical considerations of deepfake technology during research.
* Allocate time for contingency plans.
* Schedule regular meetings with your dissertation supervisor.

This plan offers a more concise schedule with shorter deliverable timelines. Remember to adapt it as needed to ensure a successful and impactful research endeavor.