별첨 3. Biweekly 보고서

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| **Biweekly Research Progress Report**   |  |  |  | | --- | --- | --- | | **Name** | **:** | Lee ChanKeun | | **Advisor** | **:** | Young-Keun Kim (signature) | | **Period** | **:** | Week 2~3 | | **WBS** | **:** | Setting Up the Environment for Using SWIR Cameras | | **Research Results in This Biweek**  **SWIR Camera Environment Setup**   * Configured the hardware and software environment for operating the SWIR camera. * Tested initial image acquisition and calibration procedures.   **Development of Circuit and Arduino Code for External Control**   * Designed and implemented a control circuit to adjust halogen lamps and regulators based on external inputs. * Developed and tested Arduino code for dynamic control of lighting conditions.   **Analysis of Image Acquisition and System Response**   * Verified the stability of the illumination system under different conditions. * Ensured proper synchronization between hardware components and image processing workflow. | | | | **Research Items in Next Biweek**   * Implement open-source libraries to visualize HSI (Hyperspectral Imaging) data in Python. * Apply deep learning models to evaluate fruit freshness using SWIR images. * Conduct preliminary experiments to validate the effectiveness of the deep learning approach.   **I** | | | | **Issues and Overall Progress**  **Conclusion Based on Interim Research Results**   * Successfully set up the SWIR camera environment and achieved basic image acquisition. * The circuit and Arduino system for external control have been developed and tested with positive results.   **Progress Analysis for WBS**   * Overall progress: **20% complete** * Remaining tasks include Python-based HSI visualization and deep learning application. * **Countermeasures for Potential Delays** * If visualization and deep learning integration face challenges, alternative feature extraction methods will be explored. * Additional reference materials and case studies on HSI-based fruit freshness evaluation will be reviewed.   **Advisor Meeting Outcomes**   * Advisor suggested comparing different spectral bands for improved defect detection. * Recommended testing with multiple fruit samples. | | | |