

Improving optical pipeline through better alignment and calibration process

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1 Introduction

Dimensional metrology and alignment methods are significant and vital during different manufacturing processes. Dimension inspection processes play a crucial role in controlling the position accuracy of production [1]. P. Maresca et al identified the trends in metrology associated with quality control at the industrial level as: fast, more precise, safer and more flexible [2]. The highly-automated measuring and control systems demanded by the industries could use several approaches to extract more value from traceable measurements [3]. An industrial metrology process is used on industrial systems, components and objects to perform inspections, alignment and measurement [4]. It offers economic argument regarding the effects of intrinsic standard technology advances and considers the measurement information infrastructure's potential impacts on cost-effectiveness and risks for IoT measuring instruments adoption [5]. Metrological systems are based upon the principle of a good alignment system. The inspection and alignment of larger scale components with a strict precision were concerned in the high-tech and heavy industry [1]. Good alignment inspection is one of the most important methods to ensure safe measurement [6].

References

- [1] Y. Gu, C. Liu, J. Wei, K. Lu, H. Ji, Y. Zheng, X. Fan, J. Wang, Z. Yuan, and Z. Gong, “Study on the dimensional metrology and alignment method for the 1/32 cfetr vv mock-up,” *Fusion Engineering and Design*, vol. 155, p. 111556, 2020.
- [2] P. Maresca, Á. Duarte, C. Wang, J. Caja, and E. Gómez, “Evaluation of traceability in continuous 2d measurements employing machine vision systems,” *Procedia Manufacturing*, vol. 41, pp. 922–929, 2019.
- [3] B. Hall, “An opportunity to enhance the value of metrological traceability in digital systems,” in *2019 II Workshop on Metrology for Industry 4.0 and IoT (MetroInd4. 0&IoT)*, pp. 16–21, IEEE, 2019.
- [4] D. K. Moru and D. Borro, “A machine vision algorithm for quality control inspection of gears,” *The International Journal of Advanced Manufacturing Technology*, vol. 106, no. 1-2, pp. 105–123, 2020.
- [5] M. Kuster, “A measurement information infrastructure’s benefits for industrial metrology and iot,” in *2020 IEEE International Workshop on Metrology for Industry 4.0 & IoT*, pp. 479–484, IEEE, 2020.
- [6] L. Peng, H. Zhang, X. Li, and S. Zheng, “Inertial measurement system for track alignment inspection based on machine vision,” in *Resilience and Sustainable Transportation Systems*, pp. 530–537, American Society of Civil Engineers Reston, VA, 2020.