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Test Results Detection Specific Learning Difficulties for High School and Vocational High School Adolescents in Southeast Sulawesi

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Abstract: This study aimed to detect and describe the prevalence and types of Specific Learning Difficulties (SLDs) dyslexia, dysgraphia, and dyscalculia among Grade X students in senior high schools (SMA) and vocational high schools (SMK) in Southeast Sulawesi Province. A descriptive quantitative design was employed. The study population comprised all 50,483 Grade X students (37,113 from SMA and 13,370 from SMK). A sample of 5,675 students from 35 schools (11 SMA and 24 SMK) was assessed using the Specific Learning Difficulties Detection Test, which evaluated reading, writing, and arithmetic skills. This was supplemented by teacher questionnaires and student learning documentation. Data were analyzed descriptively to determine the number, proportion, and categories of SLDs. A total of 624 students were identified with SLDs: 417 from SMA and 207 from SMK. The prevalence was higher in SMA (12.9%) than in SMK (8.5%). Dyslexia was the most common type, followed by dyscalculia and then dysgraphia. The study also found that teacher understanding of SLDs was generally insufficient, hampering effective detection and intervention. The study recommends: Implementing systematic, periodic early detection programs for SLDs in schools. Providing targeted training for teachers to improve identification and intervention strategies for students with SLDs. Developing and adopting adaptive, inclusive teaching methods within SMA and SMK curricula to support diverse learning needs. These findings are intended as a foundation for regional governments and educational institutions to formulate policies that improve educational services tailored to individual student needs. This research provides the first comprehensive, data-driven snapshot of SLD prevalence among adolescents in Southeast Sulawesi, a region previously lacking such evidence. By highlighting the significant prevalence of SLDs particularly dyslexia at the secondary education level and linking it to a gap in teacher awareness, the study makes a critical contribution. It shifts the focus from a purely academic concern to a systemic one, offering concrete, evidence-based recommendations for early detection, teacher training, and inclusive policy-making to address this educational challenge.

Keywords: Dyscalculia-Dysgraphia-Dyslexia, High School and Vocational School, Specific Learning Difficulties

A. Introduction

Adolescents with specific learning difficulties (SLDs) like dyslexia, dysgraphia, or dyscalculia face significant challenges in school. These conditions make it hard for them to fully participate in learning, which can lead to lower academic achievement and also affect their mental and social well-being by reducing self-confidence and increasing anxiety (Antonijevic et al., 2025; Yang et al., 2025; Yi et al., 2025; Zhu et al., 2025) (Balel & Sağtaş, 2025; Bozdağ et al., 2025; Park & Matthews, 2025) (Contreras et al., 2025; Gopi et al., 2025; Kshirsagar et al., 2025; Li et al., 2025; Radhakrishnan et al., 2025).

This is a widespread issue. In Indonesia, for example, an estimated 5–15% of school-age adolescents have an SLD, highlighting an urgent need to understand and address these challenges. Often, however, a lack of awareness means these students do not receive the appropriate support they need. While foundational skills in reading, writing, and math are crucial for success in secondary school, many SLDs go undetected. This can result in poor grades, disengagement, and a higher risk of dropping out. In regions like Southeast Sulawesi, there is especially little data on how many senior high school (SMA) and vocational high school (SMK) students are affected, making it difficult for schools to plan effective interventions (Chitra et al., 2025; Tian et al., 2025).

Current research has not yet provided a complete explanation for SLDs. Some theories focus on neurocognitive differences in the brain, while others emphasize the role of environmental factors like family or school support. There is a critical gap, however, as no model successfully integrates both perspectives, particularly for adolescents. This lack of a comprehensive theory hinders the development of effective, holistic solutions (Khalid et al., 2025; Rehman et al., 2025; W. Zeng et al., 2025), (Guo et al., 2025; Kong et al., 2025; Kothari & Kurumbanshi, 2025; Suo et al., 2025), (Lateef et al., 2025; Piasta & Kotas, 2025; Ren et al., 2025).

Therefore, this study aims to bridge that gap. It seeks to identify and understand the specific learning difficulties faced by adolescents in Southeast Sulawesi and to develop an integrated model that explains their causes. By combining local data with global research trends, this study will provide a solid foundation for creating targeted policies, school-based interventions, and innovative teaching strategies.

Ultimately, by formulating practical strategies for use in both educational and family settings, this research aims to help adolescents overcome their learning challenges. In the long term, it is expected to contribute to a more effective and inclusive education system for all students (Karthikeyan et al., 2025; Wu et al., 2025) (Ehsan et al., 2025; Feng et al., 2025; W. Ma et al., 2025; Santurro et al., 2025; Saxena et al., 2025; Tzimiris et al., 2025).

B. Methods

This study employed a quantitative descriptive design to objectively describe the results of a detection test for Specific Learning Difficulties (SLD) among adolescents, without administering any specific treatment or intervention. The research population encompassed all senior high school (SMA) and vocational high school (SMK) students in Southeast Sulawesi Province. A sample was drawn using proportional random sampling from a representative number of schools across each district and city. Respondents consisted of adolescents aged 15–18 years enrolled in SMA and SMK programs, with the sample size determined by the requirements of the data analysis. The primary research instrument was a Specific Learning Difficulties (SLD) Detection Test, developed and adapted from standard measurement tools. This test assessed foundational abilities in reading, writing, and arithmetic (literacy and numeracy), as well as cognitive functions such as attention, short-term memory, visual and auditory perception, concentration, and processing speed. To supplement the test data, the study utilized teacher observation sheets and a student learning behavior identification questionnaire. Data collection proceeded through three main stages: first, the administration of the SLD detection test to students in the sampled schools; second, the distribution of short questionnaires and interviews with guidance counselors or homeroom teachers; and third, the collection of documentary data in the form of academic scores and records of student learning behavior. The collected data were analyzed using descriptive quantitative methods. Scores from each aspect of the learning difficulty test were calculated and then classified into low, medium, and high categories. This analysis aimed to provide a general profile of learning difficulties among SMA and SMK students in Southeast Sulawesi, and a comparative analysis was conducted between the SMA and SMK student groups.

C. Results and Discussion

This study aims to describe the results of a detection test for Specific Learning Difficulties (SLDs) among adolescents in senior high schools (SMA) and vocational high schools (SMK) across Southeast Sulawesi Province. The detection was conducted with Grade X students, who represent the 15–16-year-old age group. These adolescents are at the stage of formal operational cognitive development according to Piaget's theory. Data were collected from January to May 2025 through standardized assessments of foundational literacy and numeracy abilities, as well as supporting cognitive functions such as attention, memory, and visual and auditory perception.

Based on the data collected, a total of 499 schools participated in this study, comprising 323 senior high schools (SMA) and 176 vocational high schools (SMK). The target population included 50,483 Grade X students—37,113 from SMA and 13,370 from SMK. This extensive reach, involving nearly all upper-secondary educational units in Southeast Sulawesi Province, ensures that the obtained data comprehensively

and accurately represents the real conditions of adolescent students in the region.

To ensure the assessment was both accurate and manageable, a representative sample of schools was selected for the detection test. Schools were chosen based on practical constraints, such as accessibility and readiness, and to ensure geographical diversity across the province's districts and cities. This approach captured variations in school size and student demographics while ensuring the sample remained representative of the wider population.

From all participating schools, 35 were selected as the sample for implementing the detection test. This sample comprised 11 senior high schools (SMA) with 3,241 students and 24 vocational high schools (SMK) with 2,434 students, resulting in a total of 5,675 students who participated in the assessment. The schools were selected using a proportional sampling method across each district and city to ensure a balanced geographical distribution between general academic and vocational institutions.

The detection test results revealed that, of the total students assessed, 417 senior high school (SMA) students were identified as having Specific Learning Difficulties (SLD), including dyslexia (reading difficulty), dysgraphia (writing difficulty), and dyscalculia (mathematical difficulty). Within the vocational high school (SMK) group, 207 students also showed indications of SLD in the same categories. This data demonstrates that specific learning difficulties are not limited to students in the general academic track but are also present among those in the vocational education pathway.

In terms of proportion, approximately 12.9% of senior high school (SMA) students and 8.5% of vocational high school (SMK) students in the sample showed indications of specific learning difficulties. This percentage indicates a higher prevalence of learning difficulties among SMA students compared to their SMK peers. This difference may be attributed to the distinct learning characteristics of each track; SMA curricula typically demand stronger abstract academic abilities such as conceptual understanding and linguistic skills while SMK programs more often involve students in hands-on, concrete practical activities.

This discrepancy highlights the need to look beyond the prevalence rates themselves and examine the contextual factors that may influence how learning difficulties emerge across different school types. Variations in instructional approaches, academic expectations, and cognitive demands likely contribute to the observed differences. For instance, the typically higher literacy and abstract reasoning demands of a general academic curriculum may make certain challenges more visible. Additionally, potential differences in students' exposure to literacy-intensive tasks and in the availability of specialized academic support services may further shape the overall prevalence identified in each educational setting.

Based on the analysis, dyslexia was identified as the most prevalent difficulty, followed by dyscalculia and then dysgraphia. This shows that reading remains the primary challenge for a significant portion of both senior and vocational high school students. Weaknesses in reading ability can negatively impact the comprehension of instructional texts, the completion of reading-based assignments, and the development of critical thinking skills.

The emergence of specific learning difficulties in adolescents can be influenced by multiple interacting factors. These include a lack of cognitive stimulation during basic education, learning styles that do not match their needs, and psychological factors such as low academic motivation and self-confidence. Additionally, environmental elements within the learning context can exacerbate the condition. These encompass inadequate or inconsistent teaching methods, teachers' limited ability to detect these difficulties early, and a general lack of supportive facilities.

These findings align with prior research indicating that the prevalence of learning difficulties among adolescents at the secondary level typically ranges between 5–15%. The rates obtained in this study fall within this established range, suggesting that the situation in Southeast Sulawesi is consistent with national trends. Nevertheless, the high prevalence of dyslexia and dyscalculia underscores the need for focused attention in developing more adaptive learning plans tailored to students' specific educational needs.

Based on brief interviews with guidance counselors and homeroom teachers, it was found that a significant number of teachers still lack an adequate understanding of specific learning difficulties and how to address them. Consequently, students who show indications of SLD are often mislabeled as “lazy” or “unfocused.” In reality, with appropriate intervention such as multisensory learning strategies, assignment modifications, and individualized mentoring these students can show significant improvement in their academic performance (Hu et al., 2025; Kulkarni et al., 2025; Y. Ma et al., 2025; Mahat et al., 2025; Morell et al., 2025; Sánchez-Vega et al., 2025; Shukla et al., 2025; Song et al., 2025; Tamuly et al., 2025; Tang et al., 2025; Z. Zeng et al., 2025; Zhang et al., 2025).

Based on the results and discussion presented, it can be concluded that specific learning difficulties (SLD) remain a real and significant challenge among senior and vocational high school students in Southeast Sulawesi. Addressing this issue requires a systematic, multi-faceted effort from schools, educational authorities, and related stakeholders. Key actions should include implementing periodic early detection, providing teacher training on SLD identification and support, and developing differentiated learning models. These steps will ensure that each student has access to learning opportunities tailored to their unique abilities and characteristics. Consequently, this study not only describes the factual conditions on the ground but

also provides a strong empirical foundation for formulating inclusive educational policies at the regional level.

D. Conclusions

Based on the conducted research, it can be concluded that Specific Learning Difficulties (SLD) constitute a genuine and significant challenge among adolescents in secondary schools across Southeast Sulawesi Province. The key findings reveal that of the 5,675 Grade X students from SMA and SMK who participated in the detection test, 624 were identified with indications of SLD comprising 417 SMA students (12.9%) and 207 SMK students (8.5%). This disparity suggests that the academic pressure and cognitive demands, particularly in literacy and conceptual understanding, are more pronounced in the general academic track. Dyslexia emerged as the most prevalent difficulty, followed by dyscalculia and dysgraphia, highlighting reading comprehension as a primary barrier. Contributing factors are multifaceted, stemming from internal aspects like cognitive style and attention, as well as external elements such as unsupportive learning environments, inflexible teaching methods, and a widespread lack of early detection. Critically, the study found that many teachers possess insufficient understanding of SLD, often misinterpreting signs as laziness, which prevents students from receiving appropriate support.

The implications of these findings are substantial and direct. They confirm an urgent need for the systemic implementation of early detection programs, comprehensive teacher training in SLD identification and intervention, and the development of differentiated, adaptive learning strategies within both SMA and SMK environments. These measures are essential to create inclusive classrooms that cater to individual learner needs. Consequently, this study provides an empirical foundation for regional policymakers and educational institutions to formulate targeted, evidence-based policies aimed at enhancing educational equity and support services.

For future research, it is recommended to conduct longitudinal studies to track the academic and psychosocial progression of students with SLD following intervention. Further investigation is also needed to develop and test culturally responsive, integrated intervention models that combine cognitive support with pedagogical adaptation. Additionally, exploring the specific factors that contribute to the lower identified prevalence in vocational schools could yield valuable insights for tailoring support across different educational contexts, ensuring all adolescents have the opportunity to thrive.

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References

Antonijevic, M., Zivkovic, M., Djuric Jovicic, M., Nikolic, B., Perišić, J., Milovanović, M., Jovanović, L., Abdel-Salam, M., & Bacanin, N. (2025). Intrusion detection in metaverse environment internet of things systems by metaheuristics tuned two level framework. *Scientific Reports*, *15*(1). https://doi.org/10.1038/s41598-025-88135-9

Balel, Y., & Sağtaş, K. (2025). Deep learning-based approach to third molar impaction analysis with clinical classifications. *Scientific Reports*, *15*(1). https://doi.org/10.1038/s41598-025-93783-y

Bozdağ, P. G., Mutlu, H. B., Karaduman, M., YILDIRIM, M., Khan, M. A., Alsenan, S., Baili, J., & Nam, Y. (2025). A novel approach in diagnosing knee osteoarthritis for content based image retrieval in big data analytics and medical images. *Scientific Reports*, *15*(1). https://doi.org/10.1038/s41598-025-14605-9

Chitra, R., Bamini, A. M., S, P., Stephan, T., & Martha, S. (2025). CNN-based Integrated Framework for Enhanced Diabetic Retinopathy Detection. *Recent Advances in Computer Science and Communications*, *18*(3). https://doi.org/10.2174/0126662558293742240925044450

Contreras, R. C., Viana, M. S., Bernardino, V. J. S., Santos, F. L. D., Toygar, Ö., & Guido, R. C. (2025). A multi-filter deep transfer learning framework for image-based autism spectrum disorder detection. *Scientific Reports*, *15*(1). https://doi.org/10.1038/s41598-025-97708-7

Ehsan, K., Sultan, K., Fatima, A., Sheraz, M., & Chuah, T. C. (2025). Early Detection of Autism Spectrum Disorder Through Automated Machine Learning. *Diagnostics*, *15*(15). https://doi.org/10.3390/diagnostics15151859

Feng, J., Meng, X., Shang, Y., & Niu, C. (2025). Adapter-enhanced two-stage continual defect detection. *Journal of Image and Graphics*, *30*(8), 2675–2689. https://doi.org/10.11834/jig.240663

Gopi, R., Thiruppathy Kesavan, V., Hossen, M., & Abdul Aziz, N. H. B. (2025). Bi directional sparse attention recurrent autoencoder based intrusion detection for VANET security with tuna swarm optimization. *Scientific Reports*, *15*(1). https://doi.org/10.1038/s41598-025-02729-x

Guo, Z., Zhang, B., Chen, J., Hu, Y., & Chen, Y. (2025). Contactless Fine-grained Cardiac Events Detection and Segmentation with Radio Frequency Signals. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, *9*(3). https://doi.org/10.1145/3749457

Hu, X., Jiang, Y., Xia, X., Chen, C., Liu, W., Wan, P., Bin, K., & Zhong, P. (2025). UAV-StrawFire: A visible and infrared dataset for real-time straw-fire monitoring with deep learning and image fusion. *International Journal of Applied Earth Observation and Geoinformation*, *141*. https://doi.org/10.1016/j.jag.2025.104586

Karthikeyan, V., Priyadharsini, S. S., & Balamurugan, K. (2025). Attention-based multi dimension fused-feature convolutional neural network framework for speaker recognition. *Multimedia Tools and Applications*, *84*(31), 38927–38957.

https://doi.org/10.1007/s11042-025-20694-5

Khalid, M., Akanmu, A., Awolusi, I., & Murzi, H. (2025). Detection of cognitive and attention dimensions in block programming interface for learning sensor data analytics in construction education. *International Journal of Human Computer Studies*, *205*. https://doi.org/10.1016/j.ijhcs.2025.103626

Kong, X., Zhou, L., Yao, X., & Yue, W. (2025). MND-C: a contrastive self-supervised framework for missing node detection in graphs. *Journal of Supercomputing*, *81*(15). https://doi.org/10.1007/s11227-025-07908-1

Kothari, M., & Kurumbanshi, S. (2025). SOM-Based Leader Selection Strategies for Cooperative Spectrum Sensing in Multi-Band Multi-User 6G CR IoT. *International Journal of Advanced Computer Science and Applications*, *16*(7), 202–209. https://doi.org/10.14569/IJACSA.2025.0160721

Kshirsagar, A., DeRosa, D., Politza, A. J., Liu, T., Dong, M., & Guan, W. (2025). Point-of-need one-pot multiplexed RT-LAMP test for detecting three common respiratory viruses in saliva. *Biosensors and Bioelectronics*, *288*. https://doi.org/10.1016/j.bios.2025.117836

Kulkarni, N. N., Mack, J. H., & Sabato, A. (2025). Comparative analysis of data-driven autoencoder networks for full-field expansion from sparse measurements. *Mechanical Systems and Signal Processing*, *235*. https://doi.org/10.1016/j.ymssp.2025.112957

Lateef, S. R., Saleh, S. A., Vikas, B., Bolla, V. R., Potluri, S., Subbarayudu, Y., Kumar, P. P., & Reddy, G. (2025). Utilizing Transfer Learning Approach for Epidemiological Study of Region-Specific Post-Acute Sequelae of SARS-COV-2. *Journal of Visualized Experiments*, *2025-Septe*(223). https://doi.org/10.3791/68805

Li, N., Shi, Z., Shao, Y., Sun, N., Zheng, B., & Zheng, H. (2025). MCAD-MM: a benchmark dataset and method for multi-channel acoustic detection of marine mammals. *Intelligent Marine Technology and Systems*, *3*(1). https://doi.org/10.1007/s44295-024-00051-2

Ma, W., Zhang, C., Chen, L., Wang, Z., Fan, X., & Cui, Y. (2025). P2IFormer: A Multi-Granularity Patch-to-Image Embedding Model for Fault Diagnosis of High-Speed Train Axle-Box Bearings. *Sensors*, *25*(16). https://doi.org/10.3390/s25165138

Ma, Y., Wang, S., & Li, X. (2025). An implicit mapping-based method for mixture signal recognition. *International Journal of Modeling, Simulation, and Scientific Computing*, *16*(3). https://doi.org/10.1142/S1793962325410247

Mahat, A., Nopiah, Z. M., Maat, S. M., & Razali, N. (2025). An Early Detection of Students Mathematical Competency in Engineering Mathematics Courses. *Jurnal Kejuruteraan*, *37*(4), 1683–1689. https://doi.org/10.17576/jkukm-2025-37(4)-07

Morell, J. Á., Luque-Polo, G., & Alba, E. (2025). On-street parking space localization with deep learning using low-quality images from public cameras. *Internet of Things (The Netherlands)*, *32*. https://doi.org/10.1016/j.iot.2025.101619

Park, Y., & Matthews, P. G. (2025). Math language matters: math-specific verbal skills, not analog representation of non-symbolic magnitudes, predict symbolic fraction abilities in primary school children. *Journal of Experimental Child Psychology*, *260*.

https://doi.org/10.1016/j.jecp.2025.106349

Piasta, K., & Kotas, R. (2025). Comparative Analysis of Natural Language Processing Techniques in the Classification of Press Articles. *Applied Sciences (Switzerland)*, *15*(17). https://doi.org/10.3390/app15179559

Radhakrishnan, R., Krishnan, S., Chatterjee, J. M., & Gandomi, A. H. (2025). Advancing plant leaf disease detection integrating machine learning and deep learning. *Scientific Reports*, *15*(1). https://doi.org/10.1038/s41598-024-72197-2

Rehman, Z.-U., Awang, M. K., Ali, G., Hamza, M., Ali, T., AYAZ, M., & Hijji, M. (2025). 3D-MobiBrainNet: Multi-class Alzheimer's disease classification using 3D brain magnetic resonance imaging. *Ain Shams Engineering Journal*, *16*(11). https://doi.org/10.1016/j.asej.2025.103714

Ren, L., Wang, Z., Zhang, L., Jiang, G., Xiong, Y., & Xie, T. (2025). Effective random test generation for deep learning compilers. *Science China Information Sciences*, *68*(9). https://doi.org/10.1007/s11432-023-4301-6

Sánchez-Vega, J. A., Silva-López, J. O., Salas López, R., Medina-Medina, A. J., Tuesta-Trauco, K. M., Rivera-Fernandez, A. S., Silva-Melendez, T. B., Oliva-Cruz, M., Barboza, E., Silva Junior, C. A., Sánchez-Vega, J., & Zabaleta-Santisteban, J. A. (2025). Automatic Detection of Ceroxylon Palms by Deep Learning in a Protected Area in Amazonas (NW Peru). *Forests*, *16*(7). https://doi.org/10.3390/f16071061

Santurro, A., De Simone, M., Choucha, A., Morena, D., Consalvo, F., Romano, D., Terrasi, P., Corrivetti, F., Scrofani, R., Narciso, N., Amoroso, E., Cascella, M., Fineschi, V., & Iaconetta, G. (2025). Integrative Diagnostic and Prognostic Paradigms in Diffuse Axonal Injury: Insights from Clinical, Histopathological, Biomolecular, Radiological, and AI-Based Perspectives. *International Journal of Molecular Sciences*, *26*(16). https://doi.org/10.3390/ijms26167808

Saxena, V. P., Shah, P. P., Kumhar, M., Bhatia, J., Saxena, P., & Tanwar, S. (2025). Hybrid Convolutional Neural Mixed Approached Model for Incorporating Sign Language Features. *SN Computer Science*, *6*(6). https://doi.org/10.1007/s42979-025-04131-w

Shukla, P. K., Jain, S., & Kalra, S. (2025). Leveraging Machine Learning for Early Detection of Asthmatic Children in Healthcare. *International Journal of Online and Biomedical Engineering*, *21*(9), 110–124. https://doi.org/10.3991/ijoe.v21i09.55037

Song, R., Giunchiglia, F., Li, Y., Li, J., Wang, J., & Xu, H. (2025). KALD: A Knowledge Augmented multi-contrastive learning model for low resource abusive Language Detection. *Knowledge-Based Systems*, *321*. https://doi.org/10.1016/j.knosys.2025.113619

Suo, C., Wang, J., Wang, Y., Jiang, J., Shen, Q., & Chen, J. (2025). DESIL: Detecting Silent Bugs in MLIR Compiler Infrastructure. *Proceedings of the ACM on Programming Languages*, *9*(OOPSLA2), 3093–3119. https://doi.org/10.1145/3763161

Tamuly, P., Sharma, S., & Nava, V. (2025). Integrated damage detection and time-series data augmentation for floating offshore mooring systems via variational semi-supervised learning. *Ocean Engineering*, *330*.

https://doi.org/10.1016/j.oceaneng.2025.121199

Tang, W., Deng, Z., Sun, Z., Zhao, Q., Garcia-Argibay, M., Kadan, K., Hu, T., Xue, S., Bozhilova, N., Conti, A., Lukito, S., Wu, S., Wang, G., Jin, C., Qiu, C., Liu, Q., Pan, J., Cortese, S., & Rubia, K. (2025). Childhood trauma and recent stressors in predicting subclinical psychotic symptoms among Chinese university students in southwest China: a machine learning analysis within a gender-specific framework. *BMJ Mental Health*, *28*(1). https://doi.org/10.1136/bmjment-2025-301761

Tian, X., Bai, L., & Mo, D. (2025). A Garbage Detection and Classification Model for Orchards Based on Lightweight YOLOv7. *Sustainability (Switzerland)*, *17*(9). https://doi.org/10.3390/su17093922

Tzimiris, S., Nikiforos, S., Nikiforos, M. N., Mouratidis, D., & Kermanidis, K. L. (2025). A Comparative Evaluation of Transformer-Based Language Models for Topic-Based Sentiment Analysis. *Electronics (Switzerland)*, *14*(15). https://doi.org/10.3390/electronics14152957

Wu, Y., Huang, T., Huang, H., Yu, F., Liu, J., Tang, X., Chen, L., Zhou, Y., & He, H. (2025). An integrated framework for universal coagulation test reference intervals: Cross-platform validation of eleven indirect algorithms and age-specific hierarchical optimization. *Clinica Chimica Acta*, *576*. https://doi.org/10.1016/j.cca.2025.120422

Yang, L., Wang, S., Wang, X., Wang, S., Lu, Y., & Wang, B. (2025). Contextual and orientation correction modules enhance weakly-supervised aerial object detection in remote sensing images. *Engineering Applications of Artificial Intelligence*, *161*. https://doi.org/10.1016/j.engappai.2025.112110

Yi, J., Lopez, G., Hadir, S., Weyler, J., Klingbeil, L., Deichmann, M., Gall, J., & Seidel, S. J. (2025). Non-invasive diagnosis of nutrient deficiencies in winter wheat and winter rye using UAV-based RGB images. *Computers and Electronics in Agriculture*, *239*. https://doi.org/10.1016/j.compag.2025.110865

Zeng, W., Ji, Y., Chen, D., & Zhang, H. (2025). AQ-CSL: Attention Querying Facial Action Unit Detection Net with Cross Subject Learning. *Signal, Image and Video Processing*, *19*(14). https://doi.org/10.1007/s11760-025-04627-1

Zeng, Z., Li, M., & Vannucci, M. (2025). Bayesian covariate-dependent graph learning with a dual group spike-and-slab prior. *Biometrics*, *81*(2). https://doi.org/10.1093/biomtc/ujaf053

Zhang, Y., Wang, H., Yan, Q., Yang, J., Liu, T., Fu, M., Wu, P., & Zhang, L. (2025). Research progress of unmanned mobile vision technology for complex dynamic scenes. *Journal of Image and Graphics*, *30*(6), 1828–1871. https://doi.org/10.11834/jig.240458

Zhu, Z., Wei, N., Guo, J., Yue, C., Chen, C., Zhang, Z., Wu, S., Su, J., & Song, B. (2025). Predicting the risk of threatened abortion using machine learning methods: a comparative study. *BMC Pregnancy and Childbirth*, *25*(1). https://doi.org/10.1186/s12884-025-08030-z