



Ng Tiong Sik (황충식)

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Summary | Assistant Professor at Xiamen University Malaysia, specializing in artificial intelligence, biometrics, computer vision, and secure machine learning.

Education

Yonsei University, South Korea (연세대학교, 대한민국)

2020.03–2025.02

Doctorate in Engineering

Field: Deep Learning

- Title: On the Realization of Conditional Periocular-Face Biometrics for Flexible Deployment (유연한 배포를 위한 조건부 눈 주위-얼굴 생체인식의 구현)

Multimedia University, Malaysia

2016.09–2019.01

Master of Science (Information Technology)

Field: Cryptography

- Title: Design of Tight Security Reduction for Signature Schemes

Multimedia University, Malaysia

2012.02–2016.07

Bachelor of Engineering (Hons.) (Electronics Majoring in Computer)

Field: Electronics Engineering

- Title: Secure Digital Medical Certificate System: Identity-Based Signatures

Relevant Experience

Xiamen University, Malaysia

2026.02–Present

Assistant Professor

- Conduct research on AI-based biometric recognition, multimodal learning, computer vision, and secure machine learning.
- Develop research proposals, supervise student research projects, and contribute to collaborative grant applications.
- Teach computing and cybersecurity-related courses, including biometrics, cryptanalysis, and computer architecture.
- Support curriculum development, assessment design, student mentoring, and academic administration within the school.

주식회사 플라카, 대한민국 (Placa Inc., South Korea)

2025.04–2025.12

AI and Software Technology Development Engineer

- Developed Korean conversational AI systems integrating Amazon Connect, Lex V2, Lambda, S3, DynamoDB, and CloudWatch.
- Built and adapted TTS pipelines using FishSpeech, OpenVoice, ElevenLabs, XTTS, and VALL-E for Korean voice generation.
- Fine-tuned an insurance-domain Korean chatbot with intent classification, retrieval-augmented generation, and evaluation tooling.
- Configured FreeSWITCH and SIP-based telephony workflows for RTC bridging, internal routing, and hybrid call automation.

Hitachi Hokenso Sdn. Bhd., Malaysia

2017.09–2017.12

Application Engineer – Backend Systems

- Maintained and deployed enterprise-grade backend systems using the Java Spring Framework and Oracle WebLogic Server.
- Designed SQL stored procedures and generated operational reports via Jasper Framework.
- Applied version control and collaborative development using Git for backend modules.

Skills and Qualifications

Frameworks

PyTorch, Docker, TensorFlow, Git, Amazon AWS

Programming Languages

Python, Android Java, Java SE (Spring), Bash, .NET, C++

Platforms

Windows .NET, Android, Windows Phone

Domain

Computer Vision, Secure Biometrics, Multimodal Text and Audio, Cryptography

Deep Learning Model Development

- **Computer Vision:** Convolutional Neural Networks, Vision Transformers, Hybrid CNN-Transformers
- **Text-to-Speech (TTS):** VALL-E, XTTS, FishSpeech, OpenVoice, ElevenLabs
- **Multimodal Learning:** Hybrid Multimodal Transformers, CLIP
- **Natural Language Processing:** Korean BERT fine-tuning, intent classification, retrieval-based chatbot development

Language Qualifications

- **Spoken:** English (Native), Chinese Mandarin (Fluent), Bahasa Melayu (Fluent)
- **Korean:** Basic reading, writing, and conversation (Taken TOPIK II)
- **Japanese:** Daily conversation level
- TOEIC (Test of English for International Communication): 970/990 (Dec 2022).
- TOEFL (Test of English as a Foreign Language): 96/120 (Jul 2018).

Others

- **Professional Body:** Registered Graduate Engineer under Board of Engineers Malaysia (BEM) (GE158045A).

Projects

Multimodal Biometrics Conditioning and Data-driven Template Hashing (Ph.D. Researcher)

NRF Project (South Korea)

- Conducted research on facial and periocular recognition using deep learning, focusing on robustness under occlusion (e.g., masks, sunglasses).
- Developed secure biometric template protection methods, including conditional embedding learning and cryptographic hashing for privacy-preserving authentication.
- Results were benchmarked on several public face and periocular (cropped using Viola-Jones face detector) datasets: Pubfig, FaceScrub, IMDb Wiki, AR, achieving state-of-the-art results.

TNC Signature Scheme (Finalist)

National Trusted Cryptographic Algorithm List (MySEAL, Malaysia)

- Co-developed the TNC Signature, a provably secure digital signature scheme compatible with Schnorr signatures.
- Delivered full security proofs and implemented the scheme using C and Libgcrypt, supporting both discrete logarithm and elliptic curve settings.

Tight Security Reduction Techniques for Cryptographic Primitives (M.Sc. Researcher)

FRGS Project (Malaysia)

- Investigated techniques for tight security reduction in digital signatures. Applied formal reduction-based analysis to enhance security guarantees in existing schemes under standard model assumptions.

Online Medical Certificate System using Identity-Based Signature

ITEX 2016 Exhibition (Malaysia)

- Implemented a prototype leveraging Cha-Cheon's IBS and ECC-based ElGamal encryption.
- Integrated Java Applet-based signing with QR code generation for Android, enabling real-time server-side verification of digital medical certificates.

Selected Publications (Available upon request, or see portfolio.)

Journals

- **Flexible Secure Biometrics: A Privacy Preserving Modality-Invariant Recognition System.** Tiong-Sik Ng, Jihyeon Kim, Andrew Beng Jin Teoh. IEEE Transactions on Information Forensics and Security, vol. 20, pp. 4610–4621, **2025**.
- **Attention-aware Ensemble Learning for Face-Periocular Cross-modality Matching.** Tiong-Sik Ng, Andrew Beng Jin Teoh. Applied Soft Computing, vol. 175, pp. 113044, **2025**.
- **Self-Attentive Contrastive Learning for Conditioned Periocular and Face Biometrics.** Tiong-Sik Ng, Jacky Chen Long Chai, Cheng-Yaw Low, Andrew Beng Jin Teoh. IEEE Transactions on Information Forensics and Security, vol. 19, pp. 3251–3264, **2024**.
- **On the Representation Learning of Conditional Biometrics for Flexible Deployment.** Tiong-Sik Ng, Cheng-Yaw Low, Jacky Chen Long Chai, Andrew Beng Jin Teoh. IEEE Access, vol. 11, pp. 82338–82350, **2023**.

Co-authored Publications

- **From Unimodal to Flexible: A survey of Generalized Biometric systems.** Leslie Ching Ow Tiong, Dick Sigmund, Tiong-Sik Ng, Andrew Beng Jin Teoh. Information Fusion, vol. 133, pp. 104267, **2026**.
- **Cross-Model Face Recognition via Guided Alignment Mutual Decoupled Distillation.** Jungyun Kim, Tiong-Sik Ng, Taeyong Kim, Andrew Beng Jin Teoh. IEEE Signal Processing Letters, vol. 33, pp. 466–470, **2026**.
- **Bridging the Divide Between Left and Right Palmprints for Cross-Chirality Verification.** Chengrui Gao, Ziyuan Yang, Tiong-Sik Ng, Min Zhu, Andrew Beng Jin Teoh. IEEE Internet of Things Journal, vol. 12 (15), pp. 32046–32057, **2025**.

Book Chapters

- **Using Neural Networks to Learn Biometric Template Protection.** Vedrana Krivokucića Hahn, Matthew Valenti, Veeru Talreja, Nasser Nasrabadi, Tiong-Sik Ng, Andrew Beng Jin Teoh. Handbook of Biometric Template Protection, pp. 171–201, **2026**.

Conference Proceedings

- **Conditional Multimodal Biometrics Embedding Learning for Periocular and Face in the Wild.** Tiong-Sik Ng, Cheng-Yaw Low, Jacky Chen Long Chai, Andrew Beng Jin Teoh. 26th International Conference on Pattern Recognition (ICPR), pp. 812–818, **2022**.
- **Fuzzy MP - A Fuzzy Digital Signature Scheme with Biometrics.** Tiong-Sik Ng, Andrew Beng Jin Teoh. 11th EAI International Conference on Mobile Networks and Management (MONAMI), pp. 299–315, **2022**.
- **Improving Signature Schemes With Tight Security Reductions.** Tiong-Sik Ng, Syh-Yuan Tan, Ji-Jian Chin. 15th International Conference on Information Security Practice and Experience (ISPEC), pp. 273–292, **2019**, Springer, Cham.

- **A Variant of BLS Signature Scheme with Tight Security Reduction.** **Tiong-Sik Ng**, Syh-Yuan Tan, Ji-Jian Chin. 9th EAI International Conference on Mobile Networks and Management (MONAMI), pp. 150–163, **2017**, Springer, Cham.
- **A Variant of Schnorr Signature Scheme with Tight Security Reduction.** **Tiong-Sik Ng**, Syh-Yuan Tan, Ji-Jian Chin. 8th International Conference on ICT Convergence (ICTC 2017), pp. 411–415, **2017**, IEEE.

Co-authored Publications

- **Efficient Fork-Free BLS Multi-signature Scheme with Incremental Signing.** Syh-Yuan Tan, **Tiong-Sik Ng**, Swee-Huay Heng. International Conference on Provable Security (ProvSec), pp. 250–268, **2024**.
- **Recognizability Embedding Enhancement for Very Low-Resolution Face Recognition and Quality Estimation.** Jacky Chen Long Chai, **Tiong-Sik Ng**, Cheng-Yaw Low, Jaewoo Park, Andrew Beng Jin Teoh. IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), pp. 9957–9967, **2022**.

Awards

- **Scholarship:** Hyundai Motor Company Chung Mong-koo Foundation (Mar 2020 – Feb 2024)
- **National Trusted Cryptographic Algorithm List Proposal (MySEAL):** Malaysian Digital Signature Algorithm Proposal: TNC Signature Scheme (Finalist)
- **International Invention and Innovation Exhibition 2016 (ITEX 2016):** An Online Digital Medical Certificate System Using Identity-Based Signature (Gold)

References

- Available Upon Request.