KENGO ICHIKI
市來　健吾

(kengoichiki@gmail.com)

I worked in both Academia and IT company for 10+ years respectively.

- **Engineer** (Programmer) : May 2009 – May 2023
- **Researcher** (Physicist) : April 1997 – January 2009

In last 5 years, I'm working on AI related R&D projects.

ENGINEER EXPERIENCE

I worked at ZENKEI corporation (https://zenkei.com) from **May 2009** to **May 2023** as a research engineer (programmer) at the beginning and as the chief in 5 years. It is a small company with 14 members in total. In 2023, I was leading two teams (4 + 2 people).

Due to company restructuring at the end of April 2023, the company closed Research & Development division, which I am the head. Then, I left the company.

Role (in 2023)

- Team Leader of Research & Development team (4 members)
- Team Leader of 3D Project team (2 members)

Work Projects

- Re-implementation of the image conversion engine (2009 – 2010)
- Development of panorama stitching program (2009 – 2011)
- Prototyping 3D 360 camera device (2010 – 2015)
- Building AI model for VR player generation (2017 – 2018)
- Application of AI to our services (data analysis, MLOps, etc) (2018 – 2023)
- Development of panorama-to-3D creation system (manually) (2019 – 2023)

Awards

- 10th prize at Kaggle "Kuzushiji Recognition" competition (from July 19 to October 15, 2019)
  https://www.kaggle.com/competitions/kuzushiji-recognition

Public Projects

- Lecturer for "**AI SEMINAR**" (2018)
- Organiser of "**AI FORUM**" (2019 to date)

Patents

- WO2016/208539 (Japan and China)
  "Binocular stereoscopic image providing method, distribution device, and camera unit"
  (`https://patents.google.com/patent/JPWO2016208539A1/en`)

Programming Skills

- C and C++
- C# for .NET framework
- Python
  - TensorFlow
  - PyTorch

RESEARCH EXPERIENCE

I studied in theoretical and computational physics and got Ph.D. in 1997. Since then til January 2009, I had been working as a research scientists on theoretical and computational physics.

Education

- B.Sc., Physics, Tohoku University (March 1992)
- M.Sc., Physics, Tohoku University (March 1994)
- Ph.D., Physics, Tohoku University (March 1997)

Awards

- Fellowship of the Japan Society for the Promotion of Science
  (April 1996 – March 1998)
- Fellowship of the Japan Society for the Promotion of Science
  (April 1998 – March 2001)

Experience

- **Kyoto University, Dept. Human Enrivonm. (Physics)**,
  Kyoto, Japan
  Postdoctoral fellow (supervisor: Hisao Hayakawa)
  (April 1997 – September 1997)
- **California Institute of Technology, Chemical Engineering**,
  Pasadena, CA, USA
  Postdoctoral scholar (supervisor: John F. Brady)
  (September 1997 – September 1999)
- **Kyoto University, Dept. Human Enrivonm. (Physics)**,
  Kyoto, Japan
  Postdoctoral fellow (supervisor: Hisao Hayakawa)
  (October 1999 – March 2001)
- **University of Twente, Applied Physics**,
  Enschede, the Netherlands
  Postdoctoral fellow (supervisor: Detlef Lohse)
  (May 2001 – April 2002)
- **The Johns Hopkins University, Mechanical Engineering**,
  Baltimore, MD, USA
  Postdoctoral fellow (supervisor: Andrea Prosperetti)
  (May 2002 – August 2004)
- **The University of Western Ontario, Chemistry**,
  London, ON, Canada
  Postdoctoral fellow (supervisor: Styliani Consta)
  (September 2004 – September 2006)
- **The University of Western Ontario, Applied Mathematics**,
  London, ON, Canada
  Postdoctoral fellow (supervisor: David J. Jeffrey)
  (November 2006)
- **University of Alberta, Mechanical Engineering**
  and **National Institute for Nanotechnology**,
  Edmonton, AB, Canada

Research Associate (supervisor: Andriy Kovalenko)
(February 2007 – January 2009)

Publication List

1. **K.Ichiki** and H.Hayakawa, Int. J. Mod. Phys. B (1993) Vol.7 pp.1899-1911 "*Simulation of granular particles in flow by the Stokesian dynamics method*"
2. H.Hayakawa and **K.Ichiki**, Phys. Rev. E 51,(1995) pp.R3815-R3818 "*Statistical theory of disordered suspensions*"
3. **K.Ichiki** and H.Hayakawa, Phys. Rev. E 52,(1995) pp.658-670 "*Dynamical simulation of fluidized beds: Hydrodynamically interacting granular particles*"
4. **K.Ichiki** and H.Hayakawa, Phys. Rev. E 57,(1998) pp.1990-1996 "*Analysis of statistical quantities in simulation of fluidized beds*"
5. **K.Ichiki**, Prog. Theor. Phys. Suppl. (2000) No.138 pp.736-737 "*Fast calculation of hydrodynamic interaction among particles in the Stokes flows*"
6. **K.Ichiki** and J.F.Brady, Phys. Fluids (2001) **13** 350-353 (DOI:10.1063/1.1331320)
"*Many-body effects and matrix-inversion in low-Reynolds-number hydrodynamics*"
7. **K.Ichiki**, J. Fluid Mech. (2002) **452**, pp. 231-262 (DOI:10.1017/S0022112001006735)
"*Improvement of the Stokesian Dynamics method for systems with finite number of particles*"
8. **K.Ichiki** and A.Prosperetti, Phys. Fluids (2004) **16** 2483-2496 (DOI:10.1063/1.1734951)
"*Faxén-like relations for a non-uniform suspension*"
9. **K.Ichiki**, Powder Technology Handbook, Third Edition (ISBN: 1574447823, CRC Press, January 13, 2006) "**V.21.7 Transport Properties**"
10. Q.Zhang, **K.Ichiki** and A.Prosperetti, J. Comp. Phys. (2006) Vol.212, pp.247-267 "*On the Computation of ensemble averages for spatially non-uniform particle systems*"
11. A.Prosperetti, Q.Zhang and **K.Ichiki**, J. Fluid Mech. (2006) Vol.554, pp.125-146 "*The stress system in a suspension of heavy particles: antisymmetric contribution*"
12. A.Prosperetti, **K.Ichiki** and Q.Zhang, Multiphase Sci. Tech (2006) Vol.18, pp.135-154 "*Systematic Approach to Closure Relations for Disperse Particle Flows: Inter-Phase Force*"
13. **K.Ichiki** and S.Consta, J. Phys. Chem. B (2006) **110**(39), pp.19168 - 19175 (DOI:10.1021/jp062222a)
"*Disintegration mechanisms of charged aqueous nanodroplets studied by simulations and analytical models*"
14. **K.Ichiki**, A.E.Kobryn, and A.Kovalenko, J. Comput. Theor. Nanosci. (2008) **5**(10), pp. 2004-2021 (DOI:10.1166/jctn.2008.1007)
"*"Targeting Transport Properties in Nanofluidics: Hydrodynamic Interaction among Slip Surface Nanoparticles in Solution*"
15. A. E. Kobryn, **K.Ichiki**, and A. Kovalenko Int. J. Quantum Chem. (2009) 109(8) pp.1666-1671 "*Thermodynamic dependences of slip length for nanofluidic flows over crystalline surfaces: predictions of molecular theory of solvation*"
16. **K.Ichiki**, A.E.Kobryn, and A.Kovalenko, arXiv:1302.0461
"*Resistance functions for two unequal spheres in linear flow at low Reynolds number with the Navier slip boundary condition*"

Research Interests

My research interests (in those days) were

- Theory of hydrodynamics in low Reynolds number flows (nanofluidics)
- Development of computational algorithm for hydrodynamic interaction of particles in viscous fluid called Stokesian dynamics
- Application of Fast Multipole Method to Stokesian dynamics
- Formulating and solving exact solution of hydrodynamic interaction between two particles in low Reynolds number flow
- Molecular dynamics for charged nano droplets

PERSONAL PROJECTS

Open Source Projects

- **WaoN** project (`https://github.com/kichiki/WaoN`)
- **RYUON** project (`https://kichiki.github.io/ryuon/`)

(GitHub account: `https://github.com/kichiki`)

Books (self publishing)

- "*Music and Math – music transcription for dummies*" (2020) in Japanese
  `https://www.amazon.co.jp/dp/B0C7JFHTDF`
  – This is backstory of my open source project "WaoN"
- "*Exact Computation*" (2021) in Japanese
  `https://www.amazon.co.jp/dp/B0C7JCBC6P`
  – This is backstory of "RYUON - twobody"
  and my paper `https://arxiv.org/abs/1302.0461`.
- "*ZAM - ZENKEI AI FORUM, Volume 1*" (2021) in Japanese
  `https://www.amazon.co.jp/dp/B0BHLFMXJH`
  Summary of the event "ZENKEI AI FORUM"
- "*ZAM - ZENKEI AI FORUM, Volume 2*" (2022) in Japanese
  `https://www.amazon.co.jp/dp/B0BHG8GJDR`
  Summary of the event "ZENKEI AI FORUM"
- "*Essay: Music and Math – Podcast macht frei*" (2023) in Japanese
  `https://www.amazon.co.jp/dp/B0C7JG3GYS`
  – This is transcription of my personal podcast
  `https://podcasters.spotify.com/pod/show/music-and-math`

YouTube & Podcasts

- "**HELLO! AI FORUM**" (former "**ZENKEI AI FORUM**")
  `https://www.youtube.com/@hello-ai-forum`
  `https://hello-ai-forum.github.io/`
- "**Music and Math**" podcast
  `https://podcasters.spotify.com/pod/show/music-and-math`