

# INFORMATION DISCLOSURE STATEMENT (IDS)

## Form PTO/SB/08a and 08b Reference List

**Application Title:** Computer-Implemented Systems and Methods for Closed-Loop Optimization of Hybrid Compute Architectures Comprising Under-Specified Elements Using Language Model-Driven Search Space Shaping and Hardware-in-the-Loop Evaluation

**Applicant:** Kernel Keys LLC

**First Named Inventor:** David H. Silver

**Attorney Docket No.:** KK-2025-002

**Priority Application:** 63/927,859 (November 30, 2025)

## DUTY OF DISCLOSURE

The applicant hereby submits this Information Disclosure Statement in compliance with 37 CFR 1.56, disclosing all information known to be material to the patentability of the claims. Submission of this IDS is not an admission that any cited reference constitutes prior art, nor does it imply that a search has been made.

## FORM PTO/SB/08a — U.S. PATENT DOCUMENTS

Cite No.	Document Number	Kind Code	Publication Date	Name of Patentee or Applicant	Relevant Pages/ Claims
US1	20150325235	A1	2015-11-12	Microsoft Technology Licensing LLC (Levit, Parthasarathy, Stolcke)	Entire; Claims 1-20 — LM optimization for in-domain application
US2	9,972,311	B2	2018-05-15		

<b>Cite No.</b>	<b>Document Number</b>	<b>Kind Code</b>	<b>Publication Date</b>	<b>Name of Patentee or Applicant</b>	<b>Relevant Pages/ Claims</b>
				Microsoft Technology Licensing LLC	Entire — Granted LM optimization patent
US3	20160350320	A1	2016-12-01	Google LLC (Sung, Gao, Murugesan)	Entire — Dynamic offline grammar model
US4	9,922,138	B2	2018-03-20	Google LLC	Entire; Claims 1-25 — Granted dynamic grammar model
US5	10,971,931	B2	2021-04-06	(verify USPTO)	Entire — HIL testing system

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## FORM PTO/SB/08a — FOREIGN PATENT DOCUMENTS

<b>Cite No.</b>	<b>Document Number</b>	<b>Country Code</b>	<b>Kind Code</b>	<b>Publication Date</b>	<b>Name of Patentee or Applicant</b>	<b>T</b>	<b>Relevant Pages</b>
FP1	2015/171875	WO	A1	2015-11-12	Microsoft Technology Licensing LLC	—	Entire — LM optimization (PCT family of US1)
FP2	2016/191313	WO	A1	2016-12-01	Google Inc. (Sung, Gao, Murugesan)	—	Entire — Dynamic offline

Cite No.	Document Number	Country Code	Kind Code	Publication Date	Name of Patentee or Applicant	T	Relevant Pages
							grammar model
FP3	2017/146803	WO	A1	2017-08-31	Google (Gao, Sung, Moreno Mengibar)	—	Entire — Offline semantic processing
FP4	2006/034352	WO	A3	2006	The MathWorks, Inc.	—	Entire — Code generation from models
FP5	2008/033344	WO	A3	2008	The MathWorks, Inc.	—	Entire — HDL generation
FP6	2020/102450	WO	A1	2020	(verify WIPO)	—	Entire — HIL simulation systems
FP7	2024/156237	WO	A1	2024	(verify WIPO)	—	Entire — NAS optimization
FP8	2026327	EP	A1	2009-02-18	Emori, Tadashi; Onishi, Yoshifumi	—	Entire — LM learning system
FP9	2996045	EP	A1	2016-03-16		—	Entire — LM

Cite No.	Document Number	Country Code	Kind Code	Publication Date	Name of Patentee or Applicant	T	Relevant Pages
					Nelakanti et al.		structured penalty
FP10	3385946	EP	A1	2018-10-10	Google LLC	—	Entire — Dynamic grammar model (EP family of US4)
FP11	4339843	EP	A1	2023	(verify EPO)	—	Entire — AutoML optimization
FP12	0709773	EP	A1	1996	(verify EPO)	—	Entire — OO code generator

**Note:** Column "T" indicates if English translation is attached. "—" indicates document is in English; no translation required.

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## FORM PTO/SB/08b — NON-PATENT LITERATURE DOCUMENTS

Cite No.	Document Description	Date	Publisher	Relevant Pages
NPL1	Mead, C., "Analog VLSI and Neural Systems"	1989	Addison-Wesley	Chapters 1-3 (foundational analog computing)
NPL2	Shen, Y. et al., "Deep learning with coherent nanophotonic	2017		

<b>Cite No.</b>	<b>Document Description</b>	<b>Date</b>	<b>Publisher</b>	<b>Relevant Pages</b>
	circuits," Nature Photonics, Vol. 11, No. 7, pp. 441-446		Nature Publishing Group	Entire article (photonic NN with device variation)
NPL3	Aho, A.V., Lam, M.S., Sethi, R., Ullman, J.D., "Compilers: Principles, Techniques, and Tools" (2nd Ed.)	2006	Pearson	Chapters 1, 7-9 (traditional compilation model)
NPL4	Lattner, C. & Adve, V., "LLVM: A Compilation Framework for Lifelong Program Analysis and Transformation," Proceedings of CGO	2004	IEEE	Entire paper (LLVM framework, deterministic semantics)
NPL5	Chen, M. et al., "Evaluating Large Language Models Trained on Code," arXiv:2107.03374	2021	arXiv	Entire paper (Codex, LLM code generation)
NPL6	Li, Y. et al., "Competition-level code generation with AlphaCode," Science, Vol. 378, Issue 6624	2022	AAAS	Entire article (advanced LLM code gen)
NPL7	Scholak, T. et al., "PICARD: Parsing Incrementally for Constrained Auto-Regressive Decoding from Language Models," Proceedings of EMNLP	2021	ACL	Entire paper (grammar-constrained decoding)
NPL8	Poesia, G. et al., "Synchromesh: Reliable code	2022	OpenReview	

Cite No.	Document Description	Date	Publisher	Relevant Pages
	generation from pre-trained language models," Proceedings of ICLR			Entire paper (constrained LLM generation)
NPL9	Hutter, F., Kotthoff, L., Vanschoren, J. (Eds.), "Automated Machine Learning: Methods, Systems, Challenges"	2019	Springer	Chapters 1-5 (AutoML survey)
NPL10	Dahiya, R.S. et al., "Tactile sensing—from humans to humanoids," IEEE Transactions on Robotics, Vol. 26, No. 1	2010	IEEE	Entire article (robotic tactile sensing)
NPL11	Davies, M. et al., "Loihi: A neuromorphic manycore processor with on-chip learning," IEEE Micro, Vol. 38, No. 1	2018	IEEE	Entire article (Intel Loihi neuromorphic)
NPL12	Merolla, P.A. et al., "A million spiking-neuron integrated circuit with a scalable communication network and interface," Science, Vol. 345, Issue 6197	2014	AAAS	Entire article (IBM TrueNorth)
NPL13	Yang, J.J. et al., "Memristive devices for computing," Nature Nanotechnology, Vol. 8, No. 1	2013	Nature Publishing Group	Entire article (memristor computing)

## EXAMINER SIGNATURE BLOCK

<i>Examiner Signature</i>	_____
<i>Examiner Name</i>	_____
<i>Date Considered</i>	_____

## CERTIFICATION STATEMENT

The undersigned hereby certifies that the information submitted herewith is a complete listing of all information known to applicant to be material to patentability as defined in 37 CFR 1.56.

<i>Signature</i>	_____
<i>Name</i>	David H. Silver
<i>Date</i>	_____
<i>Registration No.</i>	(If applicable)

## NOTES FOR USPTO FILING

- Copies Required:** Per 37 CFR 1.98, copies of cited patents/publications should accompany the IDS. For foreign documents (FP1-FP12), copies are available via Google Patents, Espacenet, or WIPO PatentScope.
- NPL Copies:** For books (NPL1, NPL3, NPL9), submit the title page, copyright page, table of contents, and relevant cited pages. For journal articles, submit the complete article.
- Fee Calculation:** If the IDS is filed after the period specified in 37 CFR 1.97(b), a certification statement under 37 CFR 1.97(e) or fee under 37 CFR 1.17(p) may be required.

4. **Electronic Filing:** Submit via USPTO Patent Center with all documents in PDF format.

5. **Family Relationships:**

6. US1/US2/FP1 are the same patent family (Microsoft LM optimization)

7. US3/US4/FP2/FP10 are the same patent family (Google dynamic grammar)

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## GOOGLE PATENTS LINKS

For convenience in obtaining copies (not for inclusion in official IDS form):

Cite #	Document	Google Patents Link
US1	US 20150325235 A1	<a href="https://patents.google.com/patent/US20150325235A1">https://patents.google.com/patent/US20150325235A1</a>
US2	US 9,972,311 B2	<a href="https://patents.google.com/patent/US9972311B2">https://patents.google.com/patent/US9972311B2</a>
US3	US 20160350320 A1	<a href="https://patents.google.com/patent/US20160350320A1">https://patents.google.com/patent/US20160350320A1</a>
US4	US 9,922,138 B2	<a href="https://patents.google.com/patent/US9922138B2">https://patents.google.com/patent/US9922138B2</a>
US5	US 10,971,931 B2	<a href="https://patents.google.com/patent/US10971931B2">https://patents.google.com/patent/US10971931B2</a>
FP1	WO 2015/171875 A1	<a href="https://patents.google.com/patent/WO2015171875A1">https://patents.google.com/patent/WO2015171875A1</a>
FP2	WO 2016/191313 A1	<a href="https://patents.google.com/patent/WO2016191313A1">https://patents.google.com/patent/WO2016191313A1</a>
FP3	WO 2017/146803 A1	<a href="https://patents.google.com/patent/WO2017146803A1">https://patents.google.com/patent/WO2017146803A1</a>
FP4	WO 2006/034352 A3	<a href="https://patents.google.com/patent/WO2006034352A3">https://patents.google.com/patent/WO2006034352A3</a>
FP5	WO 2008/033344 A3	<a href="https://patents.google.com/patent/WO2008033344A3">https://patents.google.com/patent/WO2008033344A3</a>
FP6	WO 2020/102450 A1	<a href="https://patents.google.com/patent/WO2020102450A1">https://patents.google.com/patent/WO2020102450A1</a>
FP7	WO 2024/156237 A1	<a href="https://patents.google.com/patent/WO2024156237A1">https://patents.google.com/patent/WO2024156237A1</a>
FP8	EP 2026327 A1	<a href="https://patents.google.com/patent/EP2026327A1">https://patents.google.com/patent/EP2026327A1</a>



Cite #	Document	Google Patents Link
FP9	EP 2996045 A1	<a href="https://patents.google.com/patent/EP2996045A1">https://patents.google.com/patent/EP2996045A1</a>
FP10	EP 3385946 A1	<a href="https://patents.google.com/patent/EP3385946A1">https://patents.google.com/patent/EP3385946A1</a>
FP11	EP 4339843 A1	<a href="https://patents.google.com/patent/EP4339843A1">https://patents.google.com/patent/EP4339843A1</a>
FP12	EP 0709773 A1	<a href="https://patents.google.com/patent/EP0709773A1">https://patents.google.com/patent/EP0709773A1</a>

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*Prepared by: Kernel Keys LLC*

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