
Research & educational
Collaboration with Vietnam
JAIST
JAPAN
ADVANCED INSTITUTE OF
SCIENCE AND TECHNOLOGY
1990
http://www.jaist.ac.jp

Basic statistics of foreign students support

- Graduate students only : 584 master, 332 phd candidates (at 2015.1.1) among 3 schools
  - Information Science, Knowledge Science, Material Science

- 32% are foreign students, and 20% are foreign faculty (36/179)
  - 21% (124/584 masters)
  - 50% (165/332 doctors)

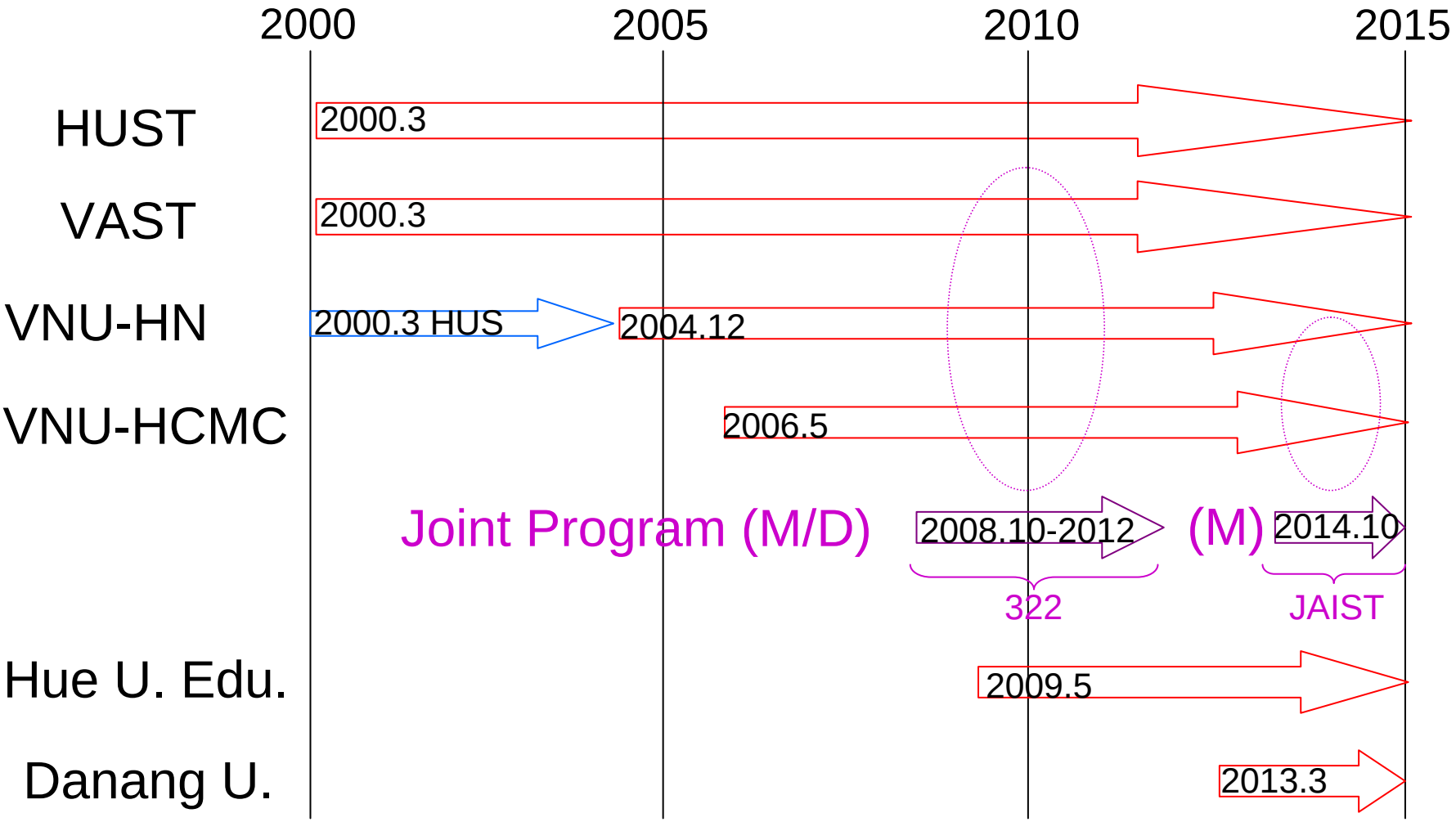
- Main technical lectures are prepared in English.
  - Technical English courses
  - Japanese language courses .

- Various students (full / partial) supports
  - Tuition exemption (Yearly <5000 USD, full/half exemption)
  - Monthly living expense = 400USD＋α

Number of foreign students (January 1, 2015)

	Knowledge Science	Information Science	Materials Science	Total
China	48	34	13	95
Vietnam	17	27	15	59
Thailand	16	17	13	46
India	1	0	37	38
Bangladesh	8	5	8	21
Indonesia	1	6	0	7
Korea	0	3	4	7
Malaysia	1	3	1	5
Others	7	14	5	23
Total	104	111	96	289

MoU with universities in Vietnam



- FIVE = VAST, VNU-HN, VNU-HCMC
- VNU-HN = HUS, UET (former COLTECH)
- VNU-HCMC = HCMUS, HCMUT, HCMUiT (2006～)

Joint program (under MoA)

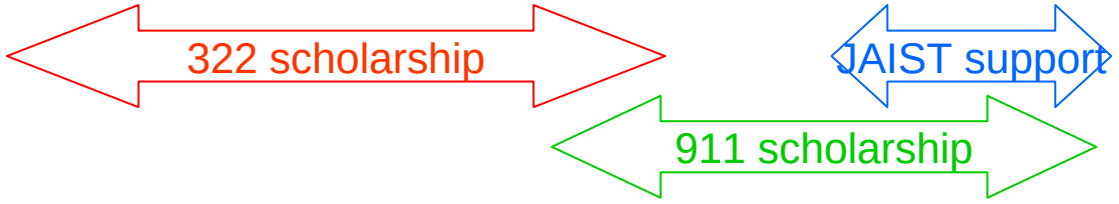
- Joint supervision (Vietnam side as subtheme supervisor)

- Master（FIVE by 322 → VNU-HCMC/UET by JAIST support)
  - *Other examples:* Tianjin@China

- Phd (FIVE by 322 → *currently interrupted*)
  - *Other examples:* Tianjin@China, Tamasart@Thai
  - Restart plan: VNU-HCMC with 911 scholarship

Students in joint educational program

			2008	2009	2010	2011	2012	2013	2014	2015	total
HUS	MS	M	8	7	10	7					32
		D	5	5	3	3					16
FIVE	IS	M	0	6	2	10					18
	IS	D	1	3	3	2	0				10
	KS	D	0	0	4	0	2				6
VNU-HCMC	IS	M							5	8	13
UET	IS	M							3	2	5
Total			14	21	23	22	2	0	8	10	100



Students *NOT* in joint educational program

			2008	2009	2010	2011	2012	2013	2014	2015	total
VIED (911)	MS	M				1					1
		D				1			1		2
	IS	D				1				4	5
	KS	D	1								1
	KS	D			4		2				6
Japan gov.	MS	M							1	2	3
		D							2		2
	IS	D				2				1	3
	KS	M							1		1
		D							1		1
Others	MS	M				1		1	2	4	8
		D				1			1		2
	IS	M						4	5	12	21
		D				2				1	3
	KS	M					2	3	6	1	12
		D							1		1
Total			1		4	9	4	8	21	25	72

Meeting with JAIST alumni in Hanoi, 2. 2009

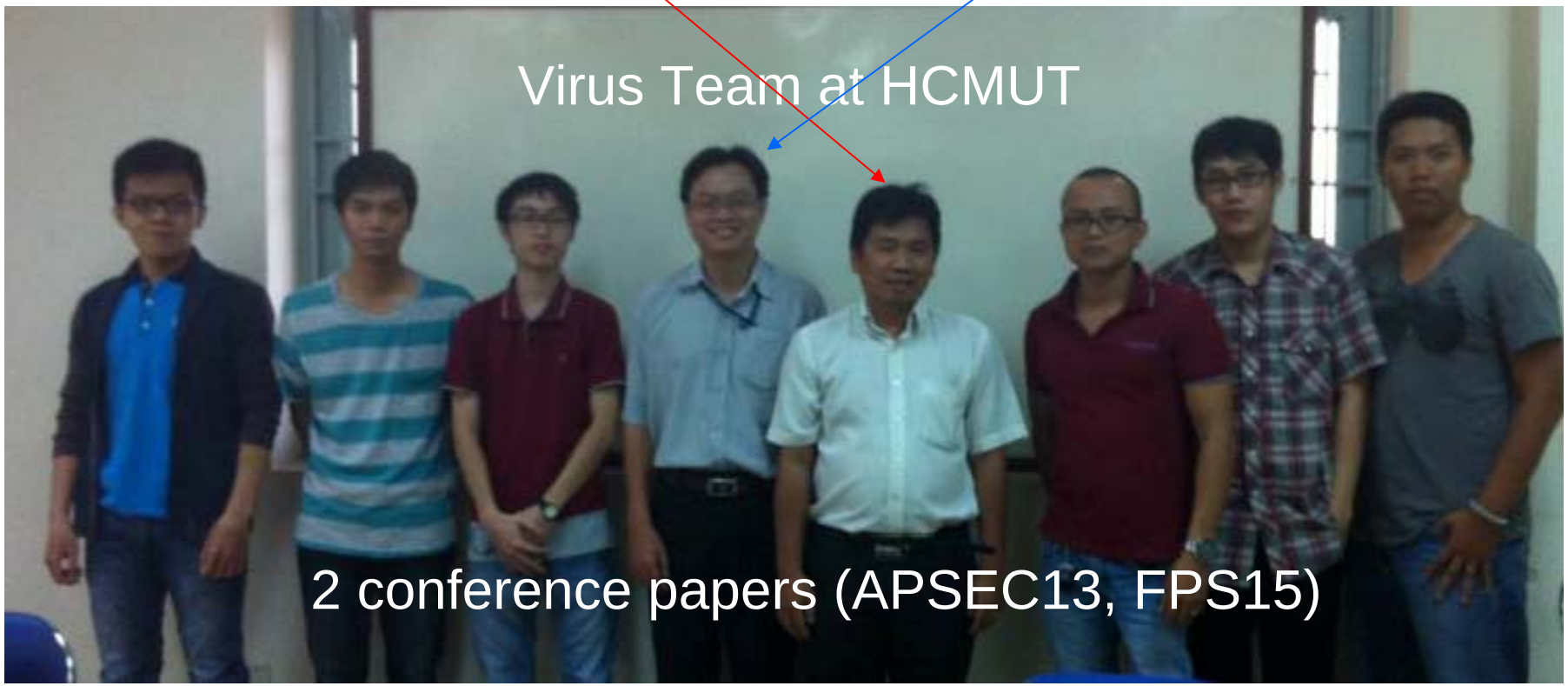
JAIST alumni symposium in Hanoi, 11. 2011

VIETNAMESE STUDENTS AT JAIST, 5.2011

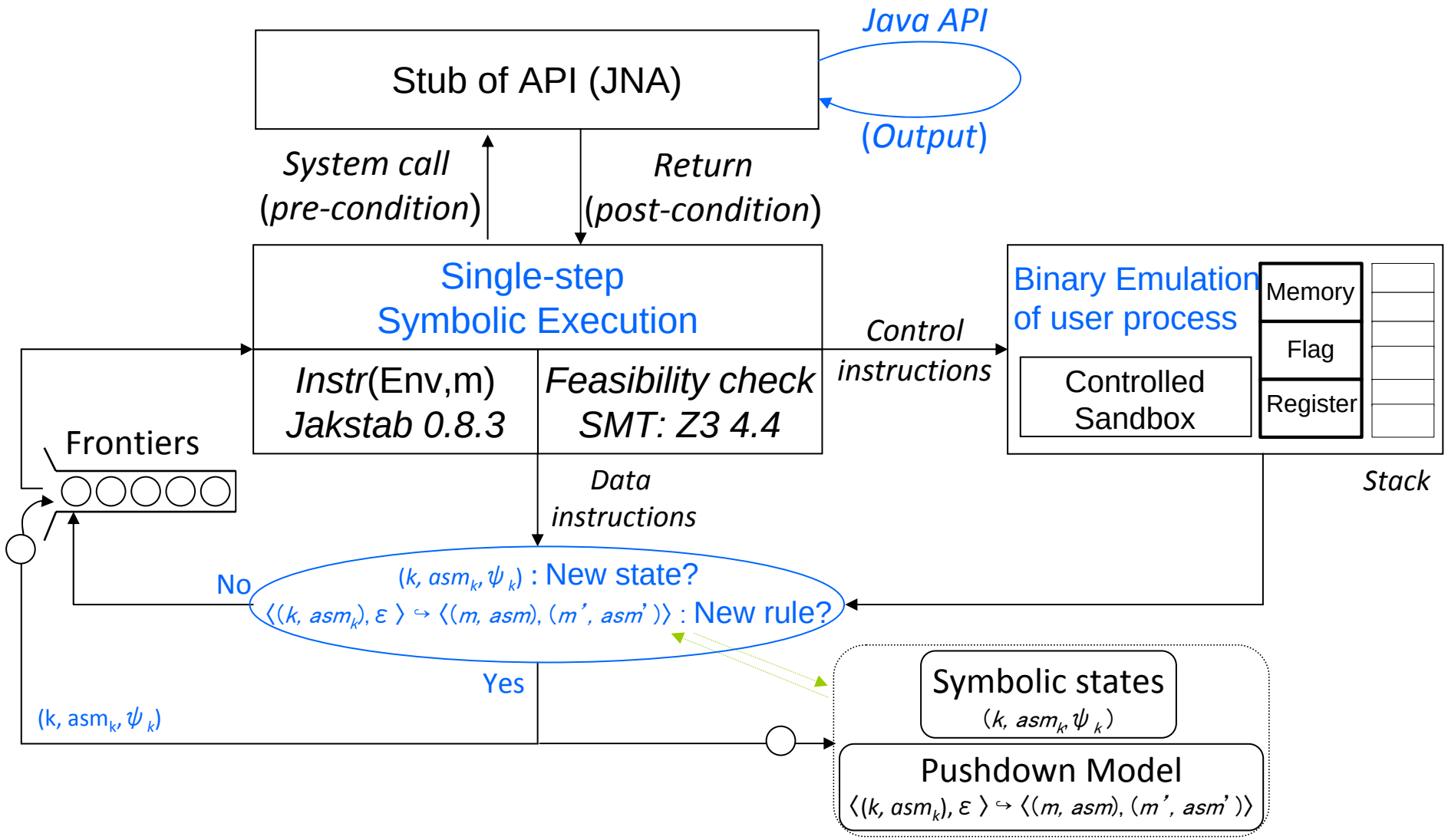
How collaboration starts ? (in my case)

- JVSE 2006@Hanoi, 2007@JAIST, 2010@Hanoi
  - Japan-Vietnam workshop on Software Engineering
  - Quan Thanh Tho@HCMUT, Abdullah Mohd Zin@UKM

- Interm: 2012 (2, Binh), 2013(1), 2014 (1 = Hai), 2015 (2)
  - Started BE-PUM project from early 2013

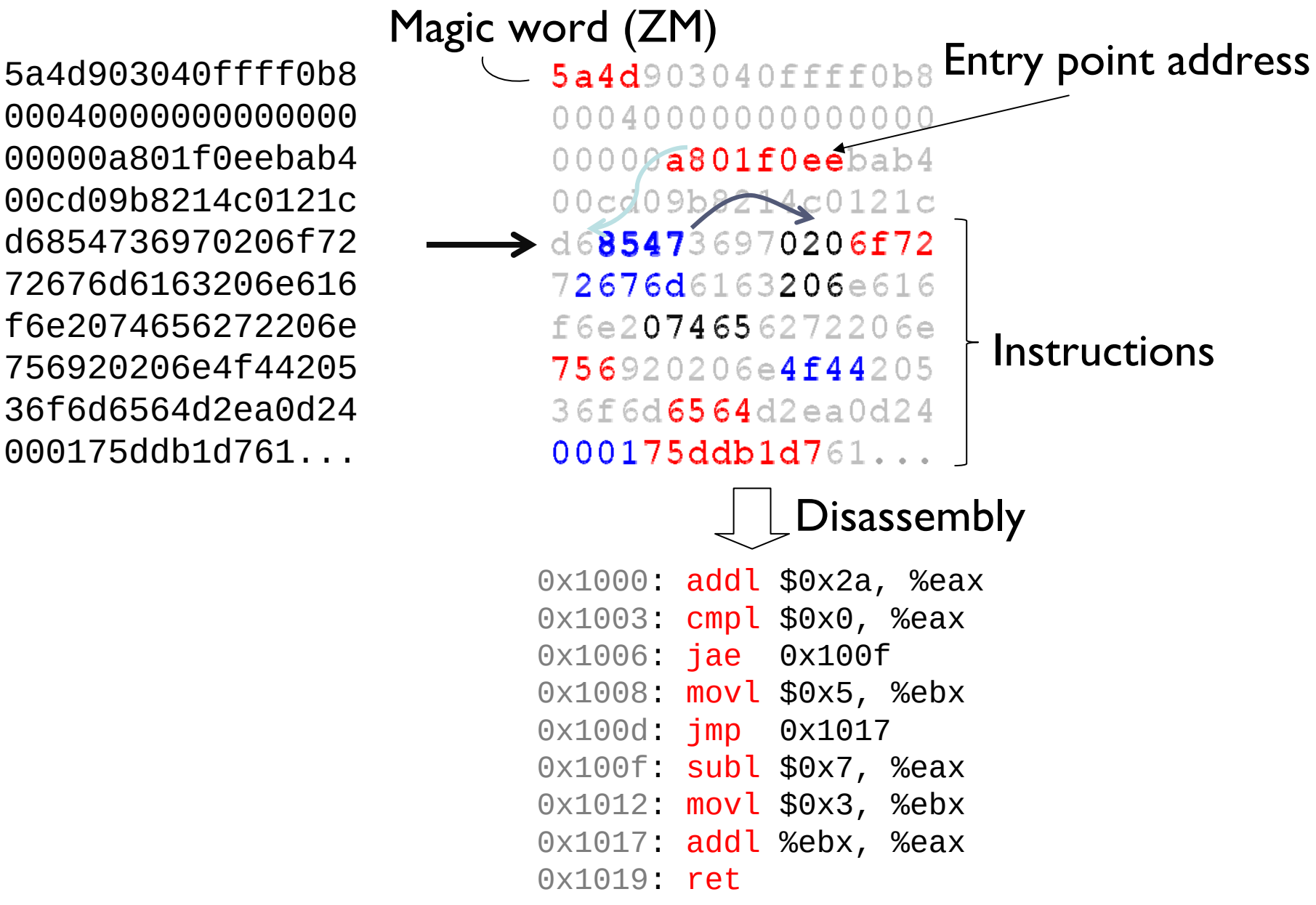


BE-PUM (Binary Emulation for Pushdown Model)



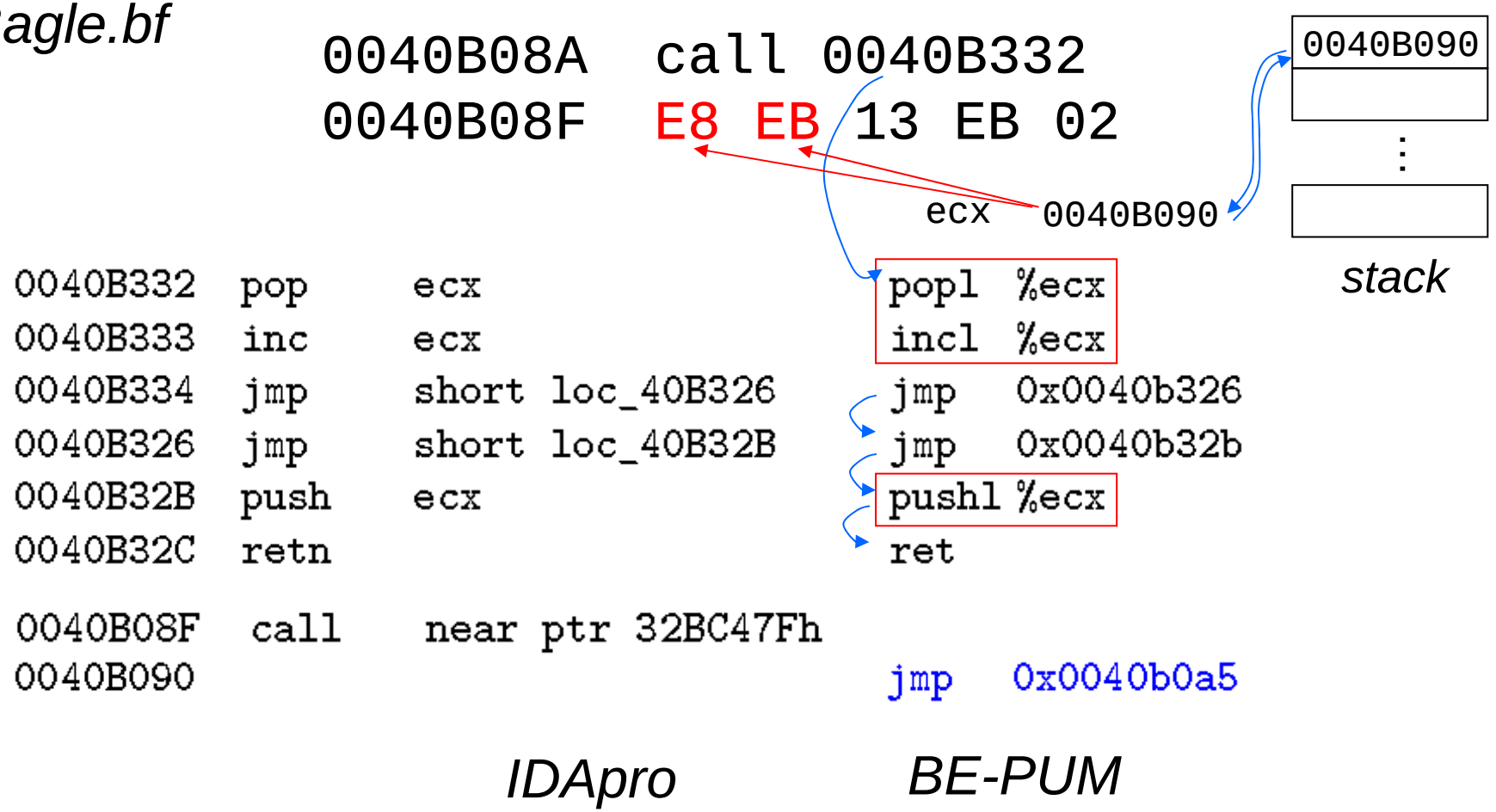
BE-PUM: Model generator for binaries (e.g., malware)

Difficulty of binary: Dynamic Interpretation of x86 binary



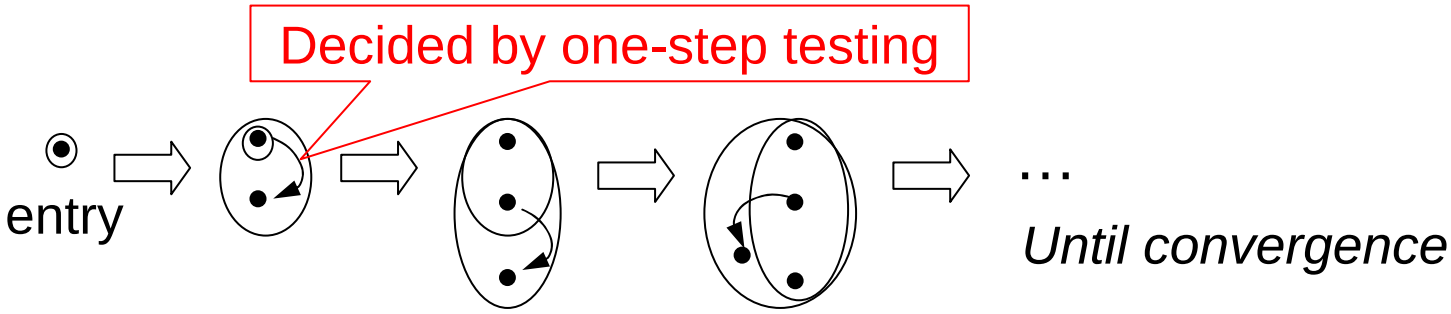
Difficulty of malware: Obfuscation (o*verlapping blocks)*

- *Bagle.bf*

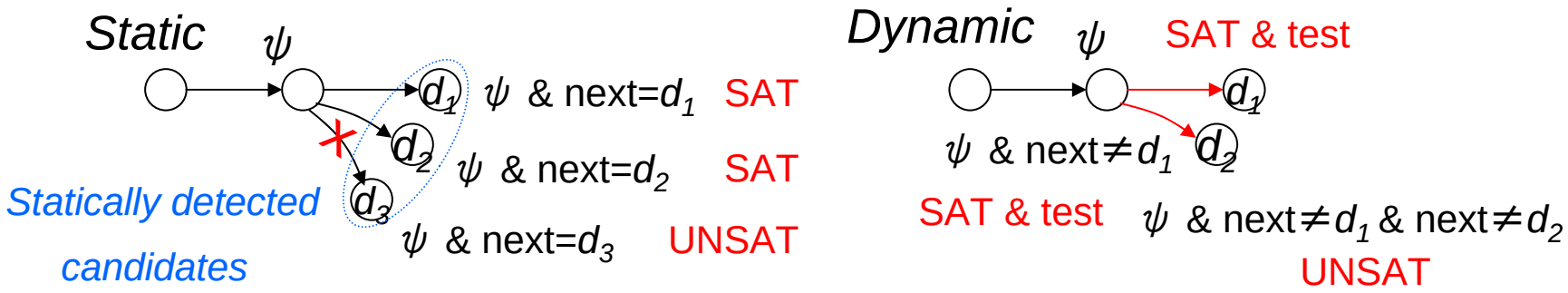


Handling malware difficulties in BE-PUM

- **On-the-fly** *for dynamic intepretation*
  - Starting from the entry node, the next node is computed by concolic testing on a partial model.



- **Static vs dynamic symbolic execution** *for indirect jumps*
  - Static : CEGAR + Symbolic execution (e.g.McVeto)
  - Dynamic : *Concolic* testing (e.g. BE-PUM)



Preliminary experiments

- Locating obfuscation code (*Presented at FPS15)*
  - Comparison between IDA Pro and BE-PUM
  - Differences show the start of obfuscation (confirmed manually on 300 malware)

- Packer identification (*Preparing for conference*)
  - >75% of recent malware are made with *packers,*
    - ✓e.g. UPX, ASPACK, FSG, NPACK, PECOMPAT, PETITE, YODA, TECLOCK, …
  - Experiments on 2000 examples supplied by LORIA are encouraging.

Example collaboration of other laboratories

- Ngo Nhut Minh@Unoki (Audio recongnition/synthesis)
  - Joint master +phd (2011 Oct - 2015)
  - Publication: 2 journals, 7 international conferences, 1 patent, 1 award (IEEE IIH-MSP-2009 Best paper)

- Tuan Dung Ho@Ogata (SE) : master (2014 Apr – now)
  - Publication: 1 international conference

- Ha Thi Thu Doan@Ogata (SE) : phd (2014 Apr – now)
  - Publication: 1 international conference

- Duc A. Hoang@Uehara (Complexity theory)
  - Phd (2013 Apr – now)
  - Publication: 1 journal, 2 international conference