



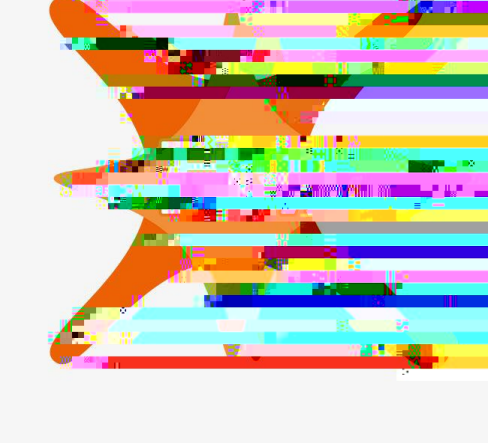
# 交叉信息研究所

Academic Newsletter

# 学术科研简报

2020年1月 - 6月 8

4242029 34



04

07

11

13

15

16

17

18

20

24

27

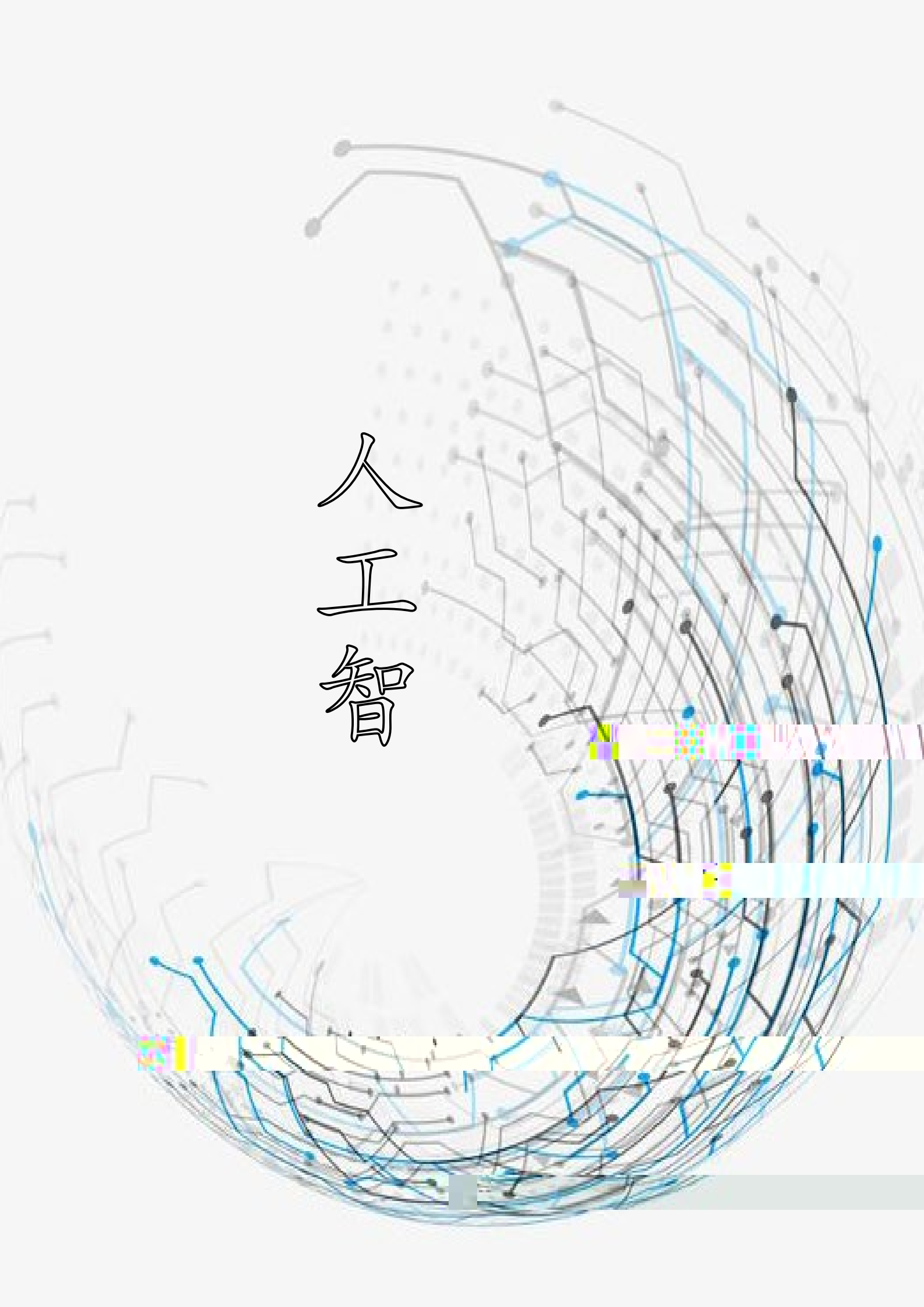
30

31

34

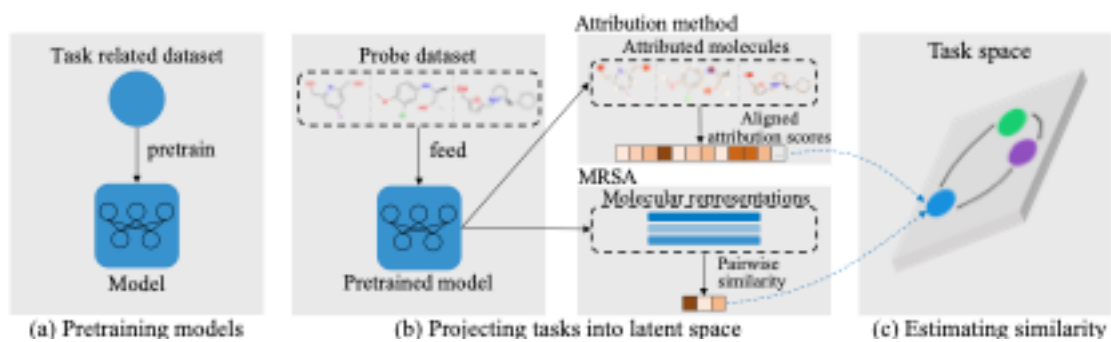
36

# 人工智





HU L], X]bn]N\Uc, S\i nW[L], FUb[d]b[ WUb, S\Uc L], DUb N\Uc UbXJ]Ubntub[ NYb[. "McTSE: Ub  
 ]bhfdYfLVYHlg\_ga ]\Uf]hmYgja Urcf Zcf ga U` a c`YWUf dfcdYfmdfYX]W]cb Hlg\_g', RECOMB 2021.

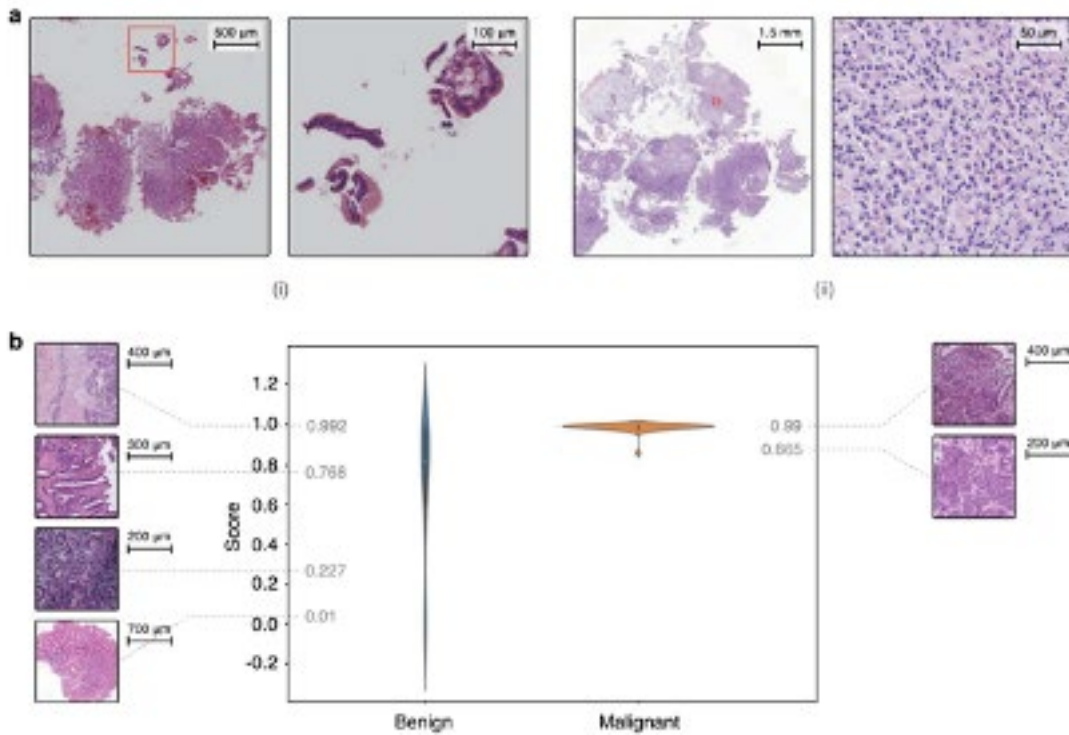


1.

100%

80.6%

N\][ Ub[ Scb[, S\i Ub[a Y] Nci , WY]i b N\ci , Ycb[ Hi Ub[, L]k Y] S\Uc, J]b[ Yi Ub, X]Ub[ bUb Gci , WY] J]b, N\UbVc WUb[, X]b C\Yb, X]Uc\i ] D]b[, J]b\cb[ L]i , C\i b\_U] Yi , CUj ]b Ki , CUbWYb[ L]i , N\i c Si b, GUb[ Xi , Yi YZb[ WUb[, X]Uce]b[ N\Ub[, DUbXUb WUb[, S\i \Uc WUb[, WY] Xi , R]WUFXC. DU] ]g UbXHi U]n]b S\]. "C`]b]W`m Udd]WVY\]g`dUk`c`[ ]W X]U]bcg]gg]n]a Zcf [ U]f]WUbVf X]Y]U]cbi gb[ X]Yd `YUb]b[", NUhi fYCca a i b]W]h]cbg2020



	TTS		ASR	
			6000	
	TTS	ASR		LTSdYYW
		LRSdYYW	1	
2	TTS	ASR		3
	TTS		ASR	
			LRSdYYW 1	98
	MOS	35		

J]b Xi , Xi TUb, Y] RYb, TÙ Q]b, J]Ub L], S\Yb[ N\Ù, T]Y-YUb L]i . "LRSdYYW: El hfYa YmLck-  
 RYgi fWSdYYW Sbh\YggUbXRYW[b]hcb" KDD 2020

a ]bS

l a USmZ l m

Z l m l

al- m a m Ll Ll m Lm -

L]b

Ll m L l m

Dci VY EbgYa VY

Z

gi Y

gi Y

Yi Ub\Uc WUb[, J]Ub L]. "Ia dfcj YX

A` [cf]h\ a g Zcf Ccbj Yl -CcbWj YM]b]a Ul Odhja ]nUh]cb",

NY fIPS 2020

DNN

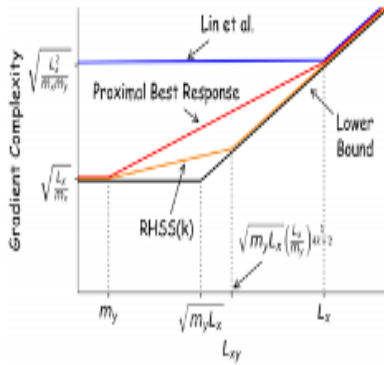


Figure 1: Comparison of previous upper bound [25], lower bound [45] and the results in this paper when  $L_x = L_y, m_x < m_y$ , ignoring logarithmic factors. The upper bounds and lower bounds are shown as a function of  $L_{xy}$  while other parameters are fixed.

C\i \Ub[ N\Ub[, Yi Ube] L], X] C\Yb,

Y]Z] J]b, P]b[ \ncb] TUb[, J]Ub L]. "Dci VY EbgYa VY A NYk

EbgYa VYMYh.cXBUGX cb SUa d`YRYk Y] \h]b] UbXFYUi fY

SYYY]cb Zcf F]bUbWU DUUAbUng]g', ICDM 2020

TABLE II: Performance of the stock trading strategies. The transaction fee is 0.3%.

		DAILY				WEEKLY			
		Ann.Ret.	Sharpe	MD	IC/IR	Ann.Ret.	Sharpe	MD	IC/IR
MLP	DR+FS	51.37%	4.941	5.98%	0.115/0.035	25.67%	4.448	2.41%	0.078/0.773
	DR+Manual	50.68%	4.343	7.94%	0.105/0.094	19.16%	3.300	2.48%	0.078/0.784
	DR+ALL	37.25%	2.923	14.34%	0.103/0.066	15.36%	3.051	2.32%	0.070/0.691
Baselines	SimpleEnsemble+All	26.74%	2.425	12.61%	0.091/0.067	12.56%	2.049	4.59%	0.058/0.670
	SimpleEnsemble+Manual	46.49%	3.813	11.75%	0.097/0.063	16.78%	2.817	2.45%	0.068/0.757
	TimeWeighted+Manual	22.19%	1.936	18.49%	0.081/0.791	15.16%	2.342	3.56%	0.061/0.700
DNN	DR+TimeWeighted+Manual	78.65%	7.760	30.33%	0.094/0.040	32.07%	3.704	3.86%	0.070/0.735
	DR+FS	49.40%	4.921	5.90%	0.103/0.061	25.73%	4.171	2.23%	0.078/0.773
	DR+Manual	47.83%	4.343	7.94%	0.105/0.094	19.16%	3.300	2.48%	0.078/0.784
DNN	DR+ALL	37.25%	2.923	14.34%	0.103/0.066	15.36%	3.051	2.32%	0.070/0.691
	SimpleEnsemble+All	18.19%	1.661	18.45%	0.100/0.058	11.55%	1.717	7.61%	0.067/0.637
	SimpleEnsemble+Manual	26.74%	2.425	12.61%	0.097/0.063	15.48%	2.907	3.57%	0.068/0.699
Baselines	TimeWeighted+Manual	23.39%	2.176	21.77%	0.093/0.768	12.47%	2.488	3.17%	0.062/0.636
	DR+TimeWeighted+Manual	22.20%	1.669	13.68%	0.083/0.832	14.19%	2.355	4.22%	0.066/0.642



Mi 'h-Afa YXBUX]h

MAB

ARS

BcfXUk ]bbYf

CcbXcfVhk ]bbYf

BcfXU

k ]bbYf

ARS-UCB

ARS-EXP3

ARS-CLW

ARS

CcbXcfVh

k ]bbYf

S]k Y] WUb[, HÜcrnb WUb[, Lcb[ Vc

Hi Ub[. "AXUdhj YA` [ cf]h\ a g Zcf Mi 'h-Ufa YXBUX]hk ]h

Cca dclhYUbXAbcbra ci gFYXUW", AAAI 2021.

W. C\Yb, Y. Di, L. Hi Ub[, H. N\Ü.

"Cca V]bUcf]U Pi fYEl d'cfU]cb Zcf Di Y]b[ BUX]h", ICML

2020

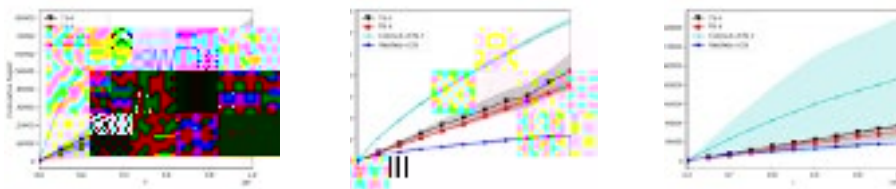
# Restless-UCB



## Restless-UCB

Sutton, Leibel, El Ghailani, Li. "Restless-UCB: Upper Confidence Bound for Restless Bandits." *Proceedings of the 2010 IEEE Conference on Decision and Inference in Learning Theory*, 2010.

Algorithm 1: Restless-UCB, *Journal of Machine Learning Research*, 2010.



1

	2 Arms	3 Arms	4 Arms	5 Arms
Restless-UCB	4s	5s	5s	5s
TS-9	4s	6s	8s	10s
TS-4	3s	4s	6s	9s
Colored-UCRL2	5s	326s	8892s	129387s

2





# ScZa U

DYd DYfa ]b]WPc`]WGFUX]Yb]g

UMf-W]h]W

Tk]b DYU]XDYd DYfa ]b]WPc`]WGFUX]Yb]g (TD3)

gZa U

gZa U

gZa U

UMf-

W]h]W

gZa U

ScZa U DYd DYfa ]b]WPc`]WGFUX]Yb]g (SD2)

ScZa U DYd Dci VYDYfa ]b]WPc`]W

GfUX]Yb]g(SD3)

SD3

gU]cZ]h]Y]U]h

L]b] P]U]b, Q]b] d]Y]b] CU], Lcb] Vc Hi Ub]. "ScZa U DYd Dci VYDYfa ]b]WPc`]WGFUX]Yb]g",

NY fIPS 2020

# Bc`hma Ubb ScZa U

Bc`hma Ubb gZa U

bcb-Y dUbgcb

Wcf`XMcXY

Bc`hma Ubb gZa U DBS

Gf]XWcf`X

DBS

gZa U

DBS

DBS-DQN

40 AHF]

49

DQN

L]b[ PUb, Q]b[ dYb[ CU, Q] MYb[,

BfIX] ]b[ RYU]mUbXDfYUa

WY] C\Yb, Lcb[ Vc Hi Ub[. "RY]bZcfWa YbhLYUfb]b[ k]h\ BIRD

DnbLa ]WbC`hma Ubb ScZa U UdXUhg', IJCAI 2020



DfYUa Yf

Gi Ub[1]Ub[ N\i, M]b[\Uc N\Ub[,

Hcb[ `U\_ LYYUbXC\cb[ ^YN\Ub[. "Bf]X] ]b[ Ia U[ ]bU]cb

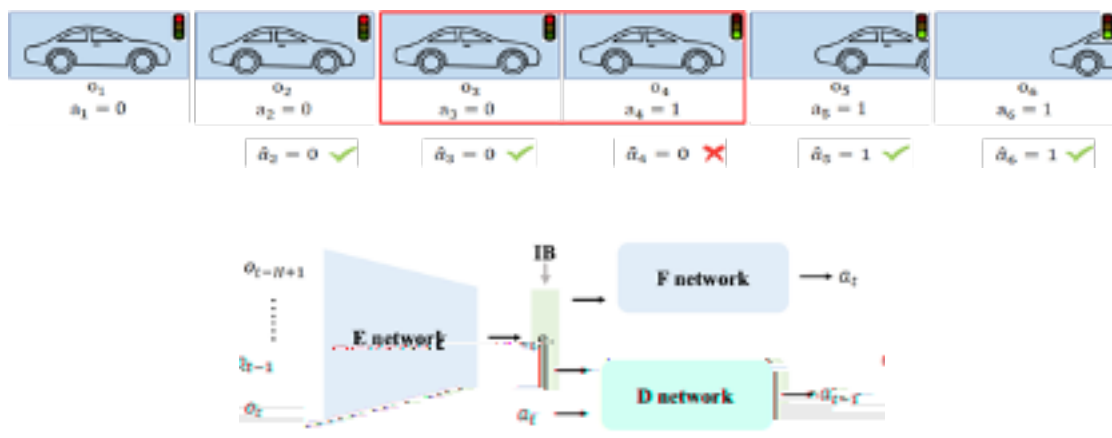
UbXRyU]mZcf McXY-BUgXDYd RY]bZcfWa YbhLYUfb]b[",

NYi fIPS 2020



C\i Ub Wb, JYfi ] L]b, Tfy cf DUFFY`, D]byg\ JhUa Ub, YUb[ GUc. "F][ \H]b[ CcdnWA[ Yb]g ]b

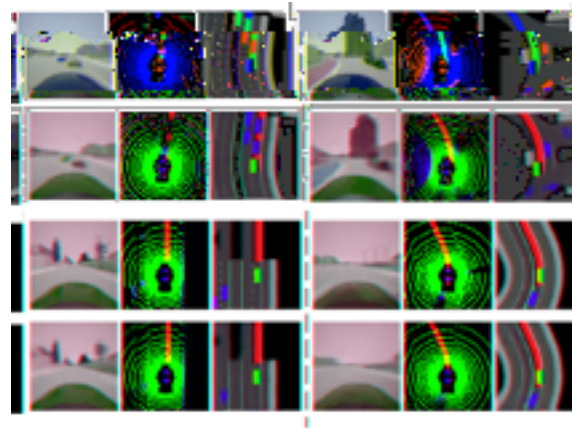
BYUj ]cfU C`cb]b[ Zfca OVgfj U]cb H]gcf]Yg', NYi fIPS 2020





JJUbrii C\Yb, S\Yb[Vc L], UbXMUgUmng\ Tca ]ri\_U "IbhYdfYfUVYEbXlc-YbXUfVUb Ai lrcbca ci g

Dfj ]b[ k ]h LUhbDYd RY]bZcfWa YbhLYUfb]b[ ", IEEE TfUbgUM]cbgcb ]bhY`][ YbhTfUbg]cflU]cb Sng]Ya g lc UddYUf.



TfUbgZcfa Yf

(Uhbhcb)

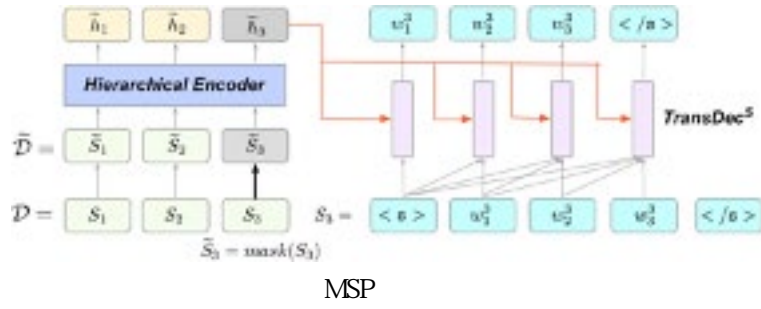
TfUbgZcfa Yf

TfUbgZcfa Yf

Uhbhcb

EbWxf

MUg\_YXSYhbWgPFYXWcb (MSP)



SYbhbWS\i `]b[ (SS) SS

SS 1 3 1 2 3 1

MSP

CNN/DM NYT

S\i g\Yb[ Xi, X]b[l]b[ N\Ub[, Y] Wi, Fi fi WY], M]b[ N\ci. "Ubq dYf] jgXEl hfUMj Y  
 Si a a Uf]nU]cb VmPfY-hfU]b]b[ H]YfUW]W TfubgZcfa Yfg', PfcWXX]b]g cZ\hY 2020 CcbZfYbW cb Ea d]f]W MYhcXg ]b  
 NUi fU LUb[i U]YPfcWg]b[: F]bX]b]g 2020

# GcS[]

(BFT)

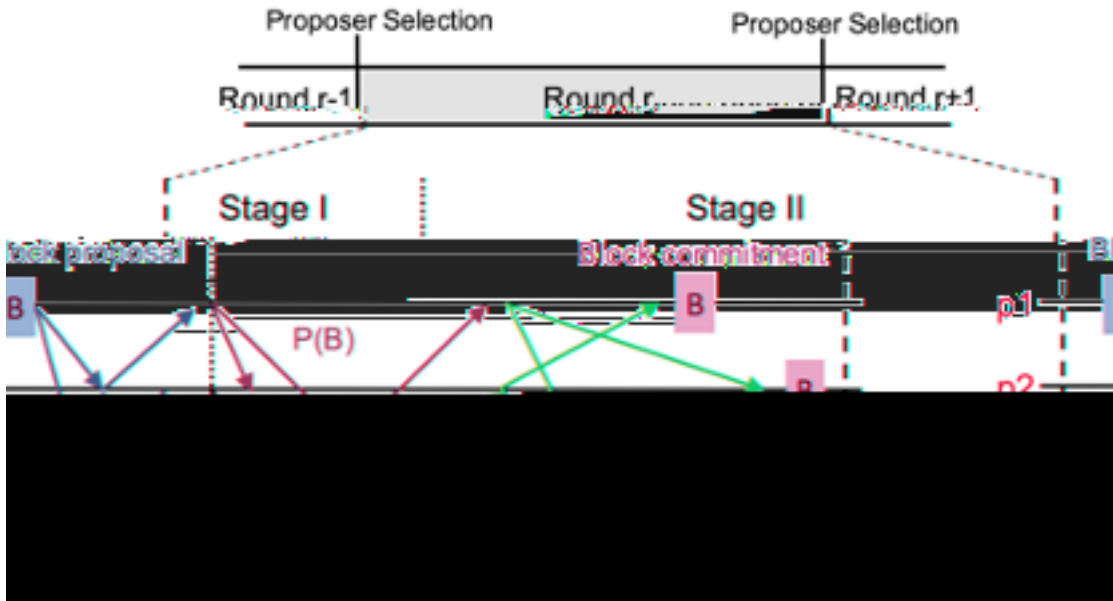
Gcg[] Gcg[]

(Gcg[])

	5	14	280	Gcg[]
15,000		158	5,000	Gcg[]
3,000	239			

Peilun Li, Guosai Wang, Xiaoqi Chen, Fan Long and Wei Xu. "Gosig: A Scalable and High-

Performance Byzantine Consensus System for Consortium Blockchains on Wide Area Network", SOCC 2020.



GPU

Jc]b

Jc]b

ID

Jc]b

OLAP

OLAP

Jc]b

GPU

CUDA

GPU

GPU V100

HBM2

900 GB/g

GPU

GPU

GPU

GPU

GPU

Jc]b

GPU

Dci VY Cci bhf

Ob-h YÜmMf[Y

Dci VY Cci bhf

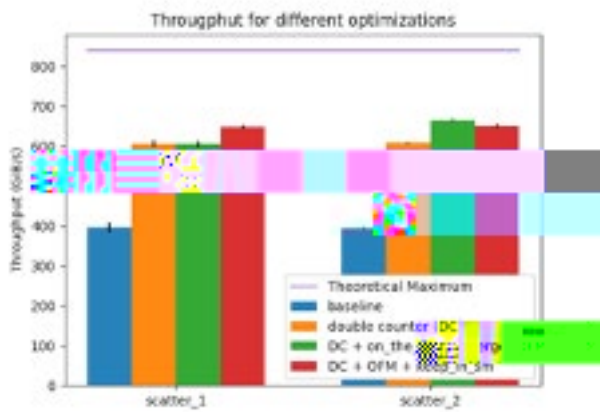
Ob-h YÜmMf[Y

g Yk

B]gdYf dUgg

GPU

VLDB SIGMOD



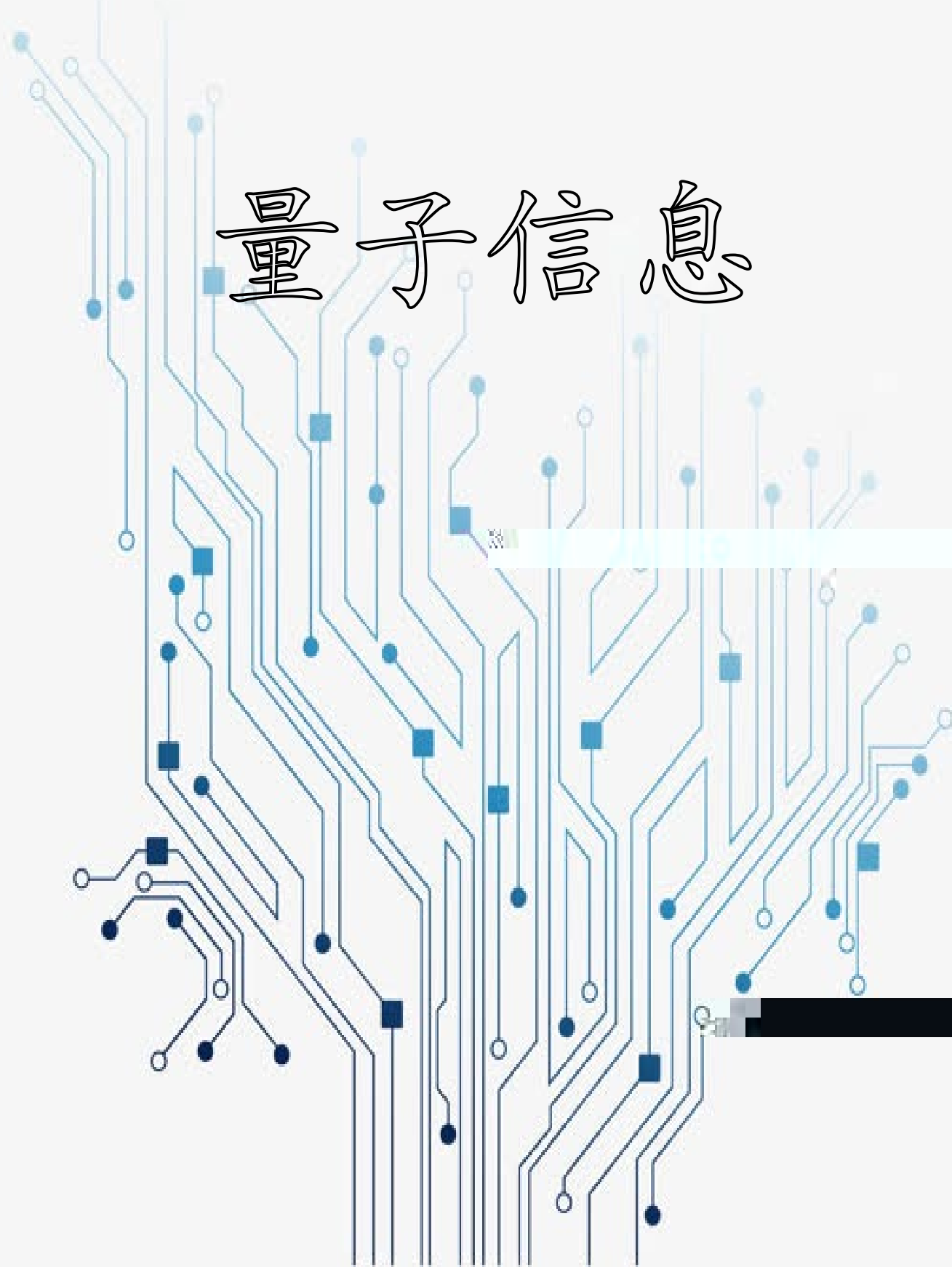
6-20

CcbÜ 1

6400

V]fi U NYkcf\_ CccfX|bUH

# 量子信息



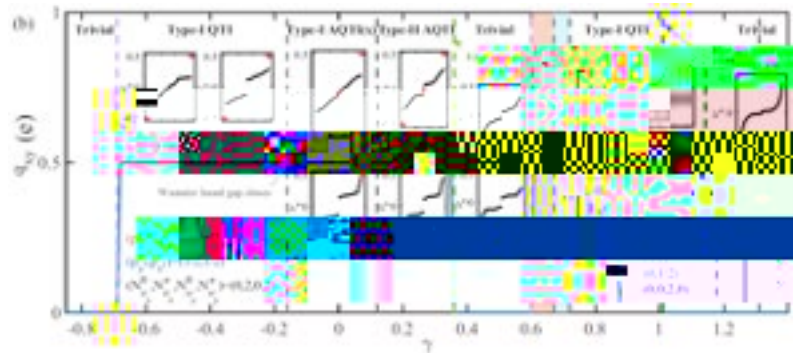
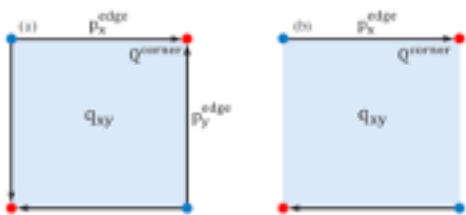
BYfm

WUbb]f

WUbb]f

YU-B]b YU[, KU L], L.-M. Di Ub, UbXYcb[ Xi . "TndYII ei Ufi dc Ylædc`c[ ]W ]bg `Urcfg`,

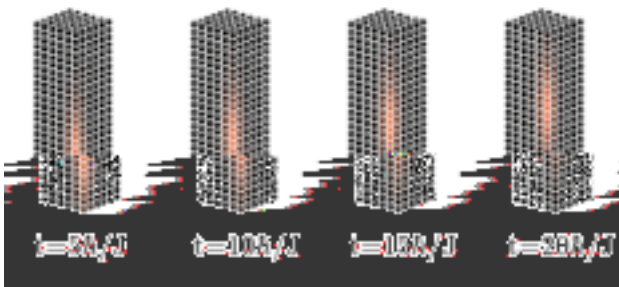
P\ng]W RY] ]k RYg]UFW 2020





Yi -L]Ub[ TÙc, N]b[ DU], YUb-B]b YUb[, Q]-Bc NYb[, UbXYcb[ Xi. "H]b[ Ygc`]hcbg]b hfYY

X]a YbgcbU gYwbXcfXf hcdc`c[ ]W ]bg `Ucfcg', NYk Jci fbU cZP\ng]W2020



Wym

Wym Y WchcbU f]b[

bcb-HYfa ]h]Ub g\_]b Y YW

Ai VfmAbXf -HUfdYf

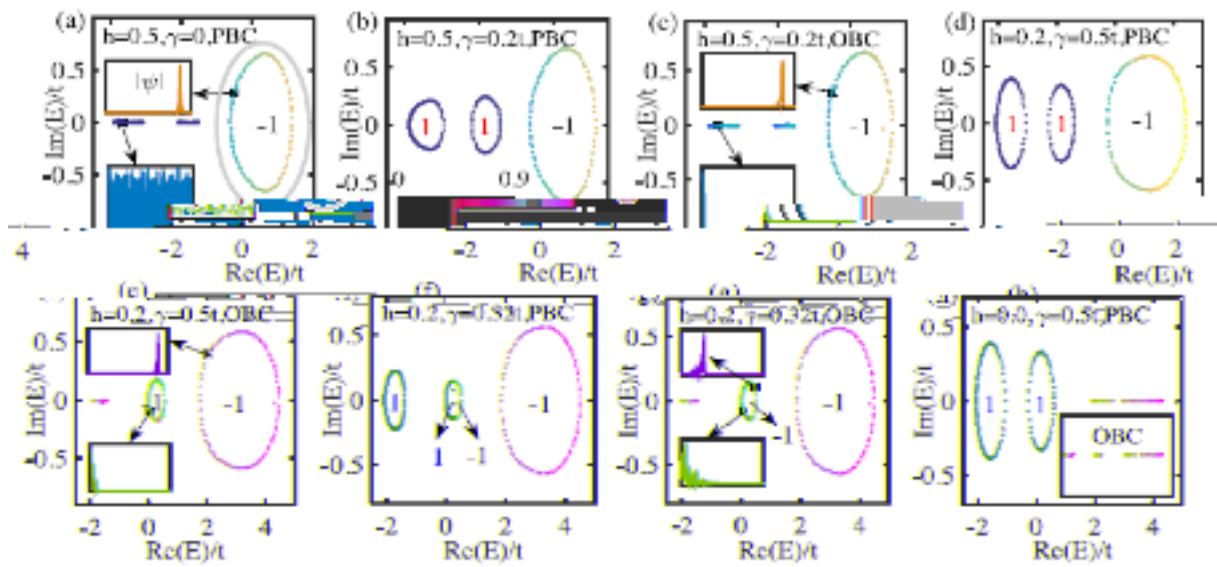
gyZXi U]lm

Ai VfmAbXf -HUfdYf

gyZXi U

Q]-Bc NYb[ UbXYcb[ Xi . "W]bX]b[ bi a VfgUbX [ YbYU]nXA cV] ]lmYX] Yg ]b bcb-HYfa ]h]Ub

ggha g', P\ng]W RYj ]Yk RYg]UFW 2020





GHN  
8381 10  
8  
O 1 U Q

2 U

16

PÜ ']

GHN

GHN

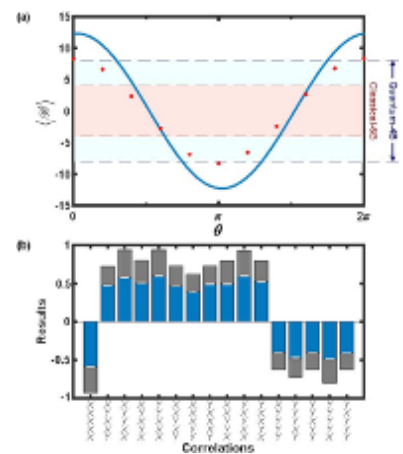
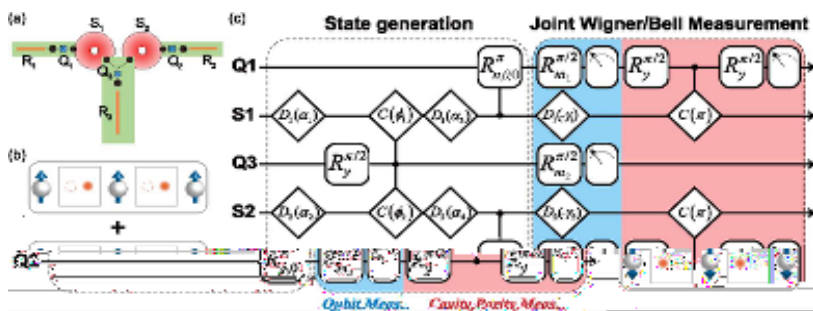
=

8381

1 W

2 V

Y. MU X. PU, W. CU, X. MI, Y.  
Xi, L. Hi, W. WUB, H. WUB, Y.P. SCB, N\Yb-B]Uc YUb[,  
S\]-B]Uc N\Yb[, UbXL. Si b. "MUb]di `U]b] Cca d`Yi HmV]X  
EbhLb] `Ya YbhUbXTYg]b] Mi `hdUfh]h`BY` IbYei U]h]Yg]b U  
Si dYfwbX] W]b] C]fW]h', P`ng]W RYj ]Yk LYHf]g 2020



2

-7 MHz

1 MHz

-0.75

MHz

0.02 MHz

0

3

CZ

1

O 1 U Q

CN CN

3

O 1

p11> p20>

p11> p20>

V Q

CN

ei Ubi a dfc Wg hca c [fU\m

CN

98.3%

: X. L], T. CU], H. YU], N. WU],

X. PU], Y. MU W. CU], J. HU], N. HI U X. HU], Y. WI ], H.

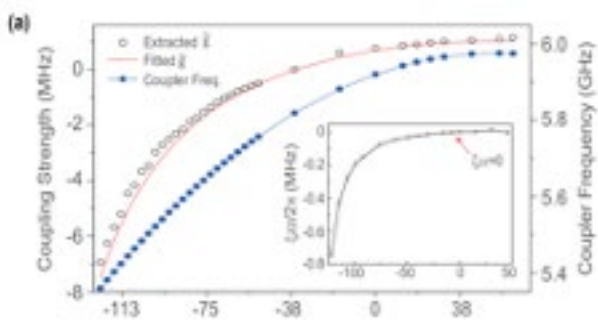
NU], H. WU], Y]di Scb], Li a ]b] Di Ub, UbXLi nu] Si b.

"Ti bUVYWi d'Yf Zcf fYU]nb] U Wbfc`YXd\UgY [UHyk ]h

XnbUa ]W`mXXWi d'YfY] ja Y]b Ug dYfWbX ]Wb] ]W]h,

P\ng]W RYj ]yk Add']YX2020.

0

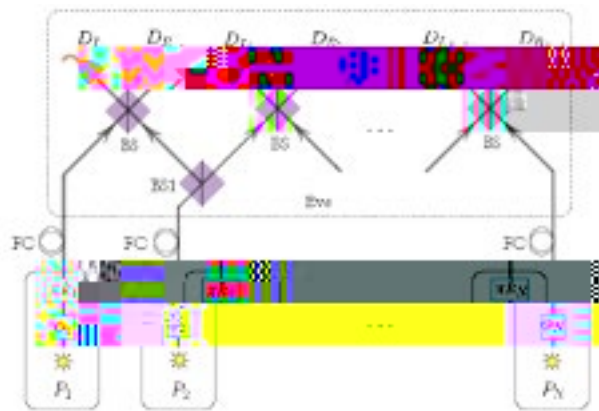


2

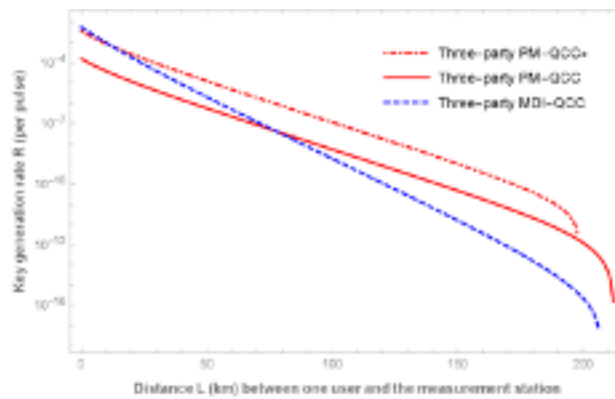
	380					1(U)
		m		nl		
				DC		
RF		DC				50
RF			45		4	260



Svi U N\Uc, PY N\Yb[, W\Yb-FY CUc, X]b-Yi Xi , Y]-N\Yb[ N\Yb, X]cb[ Z\Yb[ MU L] L], NU]-LYL]i ,  
 UbXKU C\Yb. "P\Ug-MUW]b[ Qi Ubi a Cfm]lc[ fUd\]WCcbZfYbW]b[ ", P\ng]W RYj ]Yk Add']X2020



2



3

MDI-QCC

PM-QCC

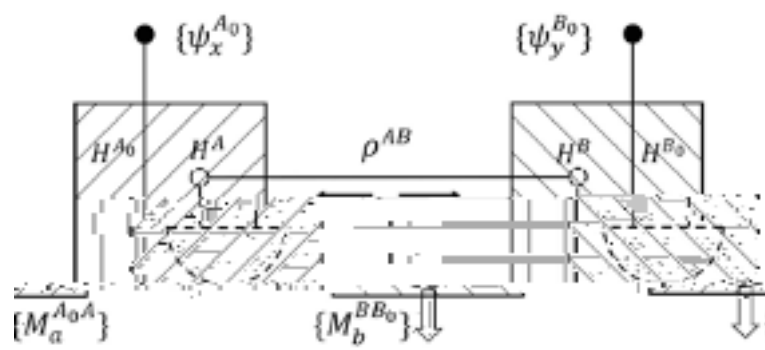
\*



(გზა) ჯეი უბი ა [Uა Y

X]b[ ၵb N\ub[ UbXQ] N\Uc. "ja i ၵbYci g WfhUWhcb cZYbLb[ `YX gUhg UbX a YUg fYá Yblg ]b

Vci bXXX]a Ybg]cbU gYá ]ei Ubi a [Uá Yg', P\ng]W RYj ]Yk RYgYUFW 2020



L]bXVUX

(L]ci j ]``]Lb GUd)

DMRG

(S\_)b Y YW

Vi ` -YX YWffYgcbXbW

: L]-WY] Yi , UbXDcb[-L]b[ DYb[. "Ubg dYj ]gXLYfb]b[ cZNcb-HYfa ]hUb Tcdc`c[ ]W P\Uyg",

UFXj :2010.14516] 1.

-

PSD fUb\_

bcbby[ Uij YfUb\_

fUb\_

-

PSD fUb\_

F

-

U

U F

-1

X]UcX]YL]b, N\Uc\i ] WY], UbX

PYb[\i ] YUc. "Qi Ubi a UbXC`Ugg]W HnM]XG YbYU]cbg

L]`]bn\] L]b UbXN\Uc\i ] WY].

Zcf C`Ugg]W CeffYU]cbg', UFX]j :2007.10673

"Qi Ubh]Z]b] Mi `hdUf]hYQi Ubi a EbfUb[ `Ya Ybh]b USYa ]-

Dy] ]Wf]bXydYbXybhMUbbYf", UFX]j :2008.12064

